PATUXENT RESEARCH REFUGE

WILDLIFE REVIEW

AN ABSTRACTING SERVICE FOR WILDLIFE MANAGEMENT
ISSUED FOR THE INFORMATION OF COOPERATORS
BY THE FISH AND WILDLIFE SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR

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Except as indicated, abstracts are by Neil Hotchkiss, editor.

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WILDLIFE (GENERAL)--BIBLIOGRAPHY & BIOGRAPHY

JACKSON, HARTLEY H. T. and others. Literature on the natural history of the arctic region, with special reference to Alaska and Canada. 48 pages. U.S.D.I., Fish and Wildlife Service, Wildlife Leaflet 317. January 1949.
This list relates particularly to vertebrates. It is arranged alphabetically by authors.

LAURENCE, BARBARA. Bibliography of publications by Glover Morrill Allen. Proceedings of the New England Zoölogical Club 24: 1-81. February 1947.
These publications are principally on birds and mammals. They cover the years from 1890 to 1943. Many of the entries have annotations.

WILDLIFE (GENERAL)--COMMUNITIES & HABITATS

ALLEE, W. C. and others. Principles of animal ecology. 837 pages, illus. W. B. Saunders Co., Philadelphia. 1949. $14.00.
5 sections comprise a wealth of detail on history, environment, populations, communities, and evolution. A 71-page bibliography gives basis to the discussion.

BALZAK, S. S.; VASYUTIN, V. F.; and FEIGIN, YA. G., Editors. Economic geography of the USSR. American edition edited by CHAUNCY D. HARRIS. 620 pages, illus. The Macmillan Co., New York. 1949. $10.00.
This is an exact and unabridged translation of the only economic geography text so far written for students in Soviet universities. It appeared in Russian in 1940. To the 65 maps in the original edition there have been added 19 others. There are appendices listing equivalents and abbreviations, a transliteration table, a glossary of Russian terms, boundary changes, index to citations, bibliography of the geography of the USSR, indexes of persons, plants and animals, and a gazeteer. In a chapter of more than 100 pages on "Natural Conditions and Natural Resources of the USSR" there is a section which describes in some detail 16 natural zones: their climate, soils, vegetation, animals. Fisheries are described in discussions of the seas and as a branch of industry. Hunting is described in the discussion of agriculture.

COOK, DAVE. Rensselaer County. New York State Conservationist 4(2): 16-18, illus. October-November 1949.
The western half of Rensselaer County contains much farm land; the higher eastern half is largely forested. The heavily polluted Hudson River forms the western boundary, Vermont and Massachusetts the eastern. Cottontails and pheasants are common in the low country, snowshoe rabbits in the high; and fishing streams and ponds, deer, and ruffed grouse are common nearly everywhere. The County has just organized a badly needed Soil Conservation District.

DRAHOS, NICK. Essex County. New York State Conservationist 3(6): 28-29, illus. June-July 1949.
45% of the second largest county in New York is State-owned. It contains the highest mountains in the Adirondacks; all of the State's important furbearing species (including marten); many deer, bear, small game animals, and waterfowl; and many fish.

WILDLIFE (GENERAL)--COMMUNITIES & HABITATS--Continued

HIGMAN, HARRY W. and HARRISON, EARL J. Pilchuck, the life of a mountain. 288 pages, illus. Superior Publishing Co., Seattle. 1949.
The authors have made an intensive study of the interrelations of the rocks, water, weather, plants, and animals of this northwestern Washington mountain. They use 3 imaginary men to tell the story.

MYERS, GEORGE S. Foreign introductions of North American fishes. Progressive Fish-Culturist 9(4): 177-180. October 1947.
Good advice to those who hastily undertake to improve the world by moving fishes [or other animals or plants] from one place to another without an understanding of either the animal or the environment.

WILDLIFE (GENERAL)--CONTROL & MORTALITY

ADAMS, LOWELL and others. The effects on fish, birds and mammals of DDT used in the control of forest insects in Idaho and Wyoming. The Journal of Wildlife Management 13(3): 245-254. July 1949.
In May 1947 more than 400,000 acres of forest in northern Idaho were sprayed with DDT to control tussock moth. The same summer 4 experimental plots were sprayed in northwestern Wyoming in an attempt to control mountain pine beetle. In Idaho some species of fish were killed, others (including 3 species of trout) were apparently unharmed. Birds and mammals were apparently unharmed by 1 pound of DDT per acre. In Wyoming a few cutthroat trout and a few birds were killed by 2 1/2 pounds of DDT per acre. Great amounts of invertebrate food organisms were killed in both Idaho and Wyoming.

GRAHAME, ARTHUR. Let's stop wasting game. Outdoor Life 103(5): 21-23, 81-82, illus. May 1949.
".....by far, the worst predator is the law-breaking pothunter and game hog!" The author tells just what kind of activities he means and what are their effects.

HOFFMANN, C. H. and LINDUSKA, J. P. Some considerations of the biological effects of DDT. The Scientific Monthly 69(2): 104-114, illus. August 1949.
"There are still many unknowns regarding the biological effects of new insecticides and the many new economic poisons. With reference to DDT, and its remarkable stability under some conditions, one of the most critical needs is for a better understanding of the hazards implied by possible cumulative action."

JONES, JOHN C. Some experiments with DDT. Pest control 17(8): 20-22. August 1949.
DDT powder in strengths of 10%, 50%, and 100% showed no ill effects when dusted on starlings, pigeons, and English sparrows. Heavy applications of different strength dust affected some house mice but not others.

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WILDLIFE (GENERAL)--CONTROL & MORTALITY--Continued

LANGFORD, R. R. The effect of DDT on the natural fauna of the forest exclusive of insect pests. In Forest spraying and some effects of DDT. Ontario Department of Lands and Forests, Division of Research, Biological Bulletin No. 2, pages 13-18, illus. 1949.

Spraying in Algonquin Park in 1944 indicated that insectivorous birds and mammals suffer indirectly from extensive killing of forest insects with DDT. Many amphibians and reptiles are killed. Stream invertebrates are practically wiped out. (See Hope (page 46), Logier (page 48), and Mackie (page 4).

MACKIE, R. E. The effect of DDT on mammals. In Forest spraying and some effects of DDT. Ontario Department of Lands and Forests, Division of Research, Biological Bulletin No. 2, pages 63-70. 1949.

Experiments in Algonquin Park in 1944 showed that DDT in very high concentrations is toxic to several species of mammals. "Both the laboratory and field tests indicated that concentrations of DDT of the order of six pounds per acre had no direct harmful effect upon mammals."

SPEIRS, J. MURRAY. The relation of DDT spraying to the vertebrate life of the forest. In Forest spraying and some effects of DDT. Ontario Department of Lands and Forests, Division of Research, Biological Bulletin No. 2, pages 141-158, illus. 1949.

The author reports upon his studies near Lake Nipigon in 1946. One 25-acre plot was sprayed with DDT at the rate of 4 pounds per acre; another was sprayed at the rate of 3 pounds per acre; and a third was not sprayed. 4 pounds per acre had no apparent effect on the bird population or on small mammals, amphibia, and fishes.

WILDLIFE (GENERAL)--DISEASES

BROWN, MALCOLM and others. A note on trichinosis in animals of the Canadian Northwest Territories. Canadian Journal of Public Health 40(1): 20-21. January 1949.

In the summer of 1948 muscle specimens were taken from 6 mammals collected on or near Southampton Island. Trichinella was found in muscles from 2 of 3 polar bears. The possibility of acquiring trichinosis from bear meat constitutes a real problem to Eskimos.

STRANDTMANN, R. W. The blood-sucking mites of the genus Haemolaelaps (Acarina: Laelaptidae) in the United States. The Journal of Parasitology 35(4): 325-352. August 1949.

A classified list of hosts comprises 7 families and 17 species of birds, 15 families and 84 species of mammals.

WILDLIFE (GENERAL)--EDUCATION

PETRIDES, GEORGE. Wildlife training at Texas A. and M. Texas Game and Fish 7(8): 9,23-24, illus. July 1949.

WILDLIFE (GENERAL)--FAUNAS & MANUALS

JAEGER, ELLSWORTH. Tracks and trailcraft. 381 pages, illus. The Macmillan Co., New York. 1948. $3.75.

The author presents in clear drawings and brief text information about many kinds of animals (man, mammals, birds, reptiles, amphibians, crustaceans, molluska, insects). He discusses fossil tracks; Indian tracking; scent trails; the anatomy of animal tracks; tracks in such different habitats as back yards, barnyards, field, forest, and zoo; tracks in snow; and tracking games. Many of the drawings of tracks have beside them a drawing of the animal that made them. These drawings and the descriptions of form and habits make the book a good manual for identification.

PALMER, E. LAURENCE. Fieldbook of natural history. 664 pages, illus. McGraw-Hill Book Co., Inc., New York. 1949. $5.00.

Here, in tabular form, is an enormous amount of information about stars and planets, minerals and rocks, plants and animals. Emphasis is on man's relations with things (economic geology; domestic plants and animals; useful and destructive insects; useful and destructive wild birds and mammals). The book is not a manual for identification; but clear drawings and detailed descriptions make possible the identification of many things.

SOPER, J. DEWEY. Notes on the fauna of the former Nemiskam National Park and vicinity, Alberta. The Canadian Field-Naturalist 63(5): 167-182, illus. September-October 1949.

This area is in the shortgrass plains of southeastern Alberta. The author made his principal observations in the summer of 1941. He describes the physical geography, climate, vegetation, and fauna, and has detailed notes on 16 species of mammals, 48 birds, and 3 reptiles.

WILDLIFE (GENERAL)--HARVESTS

LEEDY, DANIEL L. Hunting statistics in the United States, 1936 vs. 1946. Transactions of the Fourteenth North American Wildlife Conference. Pages 410-423. 1949.

Statistics showed 76% more hunting licenses were sold in the 1946 hunting season than in the 1936 season. Higher kills were reported in 1946 for 14 species, mostly animals of the brush and forested lands. Decreased kills were reported for Hungarian partridge, ruffed grouse, mourning dove, white-winged dove, prairie chicken, cottontail rabbit, and fox squirrel.--H. A. Slattery.

WILDLIFE (GENERAL)--MANAGEMENT

ALLEN, DURWARD L. Recent trends in farm wildlife management. Transactions of the Fourteenth North American Wildlife Conference. Pages 253-260. 1949.

Agricultural lands play a key role in producing the nation's annual wildlife crop. Federal aid funds are being used to aid farmers in improving their land for wildlife. Popular activities are the planting of bicolor lespedeza and multiflora rose for food and cover and the building of fish ponds.

WILDLIFE (GENERAL)--MANAGEMENT--Continued

ANDERSON, WALLACE L. Agronomic practices in relation to wildlife. Journal of Soil and Water Conservation 4(3): 107-110,115-116,128, illus. July 1949.

".....many agronomic practices contribute to the real value of wildlife and to a resultant better biological balance of farm and ranch lands." Practices that increase wildlife are strip cropping, stubble-mulch tillage, grassing of waterways and headlands, establishing permanent cover crops in orchards, use of shrubby field borders, renovation of pastures with dry-weather legumes, proper grazing of pastures, and supplying water for livestock. The author also discusses range management and wildlife and modification of time of plowing and time of mowing for the sake of wildlife.

BARKER, ELLIOTT S. Annual report of the Department of Game and Fish for the fiscal year ending June 30, 1949. New Mexico 27(9): 33-35,55-59. September 1949.

General wildlife conditions; legislation; game and fish protection; game refuges; big game seasons; pheasant, quail, and lesser prairie chicken seasons; migratory bird seasons; fish propagation; fish habitat; fishing; fisheries biology; beaver control; predator control; Federal Aid work; and game propagation are some of the subjects discussed.

BODE, I. T. and others. Report to the public--conservation in Missouri, 1948-49. Missouri Conservationist 10(9): 1-32, illus. September 1949.

This report includes descriptions of the work of the fish and game, forestry, field, education-information, and fiscal divisions. The section on "Game Management and the Land" reviews investigations on cover, food, other problems of populations, and harvests; the management of game through refuges; and the management of game and fur harvests.

CHASE, WARREN W. Recent advances in forest game management. Transactions of the Fourteenth North American Wildlife Conference. Pages 232-238. 1949.

Recently there has developed greater cooperation between wildlife managers and timber managers. Several states are making progress in the management of wild turkeys and a few in the management of deer. More detailed information at less cost is being obtained through the use of aerial photography. Failure to harvest excess wildlife is the greatest weakness in management.

CLARK, JOHN E. Maryland Board of Natural Resources, Fifth Annual Report, 1948. 186 pages, illus. 1948.

This report includes individual reports from the Departments of Tidewater Fisheries, Game and Inland Fish, Forests and Parks, Geology, and Research and Education. The report of the Department of Game and Inland Fish includes an account of different game species over the State, game management, fish management, law enforcement, and public relations.

CLARKE, C. H. D. Regulated townships. Sylva 5(2): 3-15, illus. March-April 1949.

"In well over 100 townships of southern Ontario the hunting of pheasants and rabbits is subject to a special township license in addition to the ordinary provincial hunting license." The author tells why this came about and how it works.

WILDLIFE (GENERAL)--MANAGEMENT--Continued

DUCK, L. G. Cooperative management of fish and wildlife resources of large impoundments in Oklahoma. Transactions of the Fourteenth North American Wildlife Conference. Pages 313-318. 1949.

The Oklahoma Game and Fish Department, the Oklahoma Agricultural and Mechanical College, the University of Oklahoma, the Corps of Engineers, and the U. S. Fish and Wildlife Service are cooperating in ".....the pooling of certain resources to develop sound biology and wildlife management practices for impounded waters and their watersheds."--M. A. Slattery.

DYER, HAROLD JACOBSEN. Preliminary plan for wildlife management on Baxter State Park. Thesis, University of Maine, 1948 (copied from an anonymous abstract in Journal of Forestry for June 1949, page 478).

This area of 140,000 acres includes Mount Katahdin, Maine. Observations were made on moose, deer, marten, fisher, beaver, ruffed grouse, spruce grouse, and woodcock. Virgin forest at higher elevations was most suitable to wildlife; cutover coniferous forest was least suitable.

EDMINSTER, FRANK C. Soil conservation districts--the answer to better farm game cover. Pennsylvania Game News 20(5): 3-6,30, illus. August 1949.

ELLIOTT, CHARLES. You've got to earn better sport. Outdoor Life 104(1): 17-19,63, illus. July 1949.

".....the most vital single factor in the improvement or destruction of a game species is the behavior of man himself." Game belongs to everybody and if no one took more than his lawful and reasonable share more of our resources could go into improving habitat.

FERNOW, THEODORE C. and QUINN, I. T. Action on the Blue Ridge. Pages 586-592 in "Trees; the yearbook of agriculture, 1949." Superintendent of Documents, Washington 25, D. C. $2.00.

The authors describe the cooperation between the State of Virginia and the U. S. Forest Service in the management of wildlife on 1½ million acres of national forest land in Virginia. It has resulted in big increases in deer, bear, and turkeys, and a big increase in hunting.

GABRIELSON, IRA N. Foresters as wildlife managers. Journal of Forestry 47(9): 698-699. September 1949.

Wildlife is an important, and sometimes the most important, crop of forest land. Recreationists and wildlife enthusiasts have the most sustained interest in the forest of any group of users. On some forest areas the numbers of deer are still being reduced although the range is recovering. Management and restoration of the Merriam turkey is a challenge to foresters of the Southwest.--M. M. Hosley.

WILDLIFE (GENERAL)--MANAGEMENT--Continued

GRANGE, WALLACE BYRON. The way to game abundance: with an explanation of game cycles. 365 pages, illus. Charles Scribner's Sons, New York. 1949. $6.00.

The author's many years of work with game animals lead to a succession of illuminating chapters that describe "The Pattern of Life", "Plant and Animal Successions", "Population Cycles", and "The Technology of Game Increase." The inevitable conclusion is that "Game abundance is a function of suitable habitat....."; and that game management is based on the understanding and management of plants.

HUNTER, GILBERT N. The utility of personal interviews in obtaining information on game and fish resources. Transactions of the Fourteenth North American Wildlife Conference. Pages 239-252, illus. 1949.

Accurate statistics are necessary in attaining management objectives. The Colorado survey, which was developed under the advisorship of the National Opinion Research Center, is the first instance where interview technique was used to obtain statistics. The survey for a 2-year period cost $16,316.33. Several tables illustrate the findings.--M. A. Slattery.

MACIAS A., LUIS. Wildlife problems in Mexico. Transactions of the Fourteenth North American Wildlife Conference. Pages 9-16. 1949.

"Hunting of migratory birds in Mexico is done strictly in accordance with the International Treaty." Mexico's annual kill of wild ducks is very low. To determine the causes of diminishing numbers and to estimate annual productivity it is essential to train technicians. This has been started in Mexico.

PIRNIE, MILES D. The relation of wildlife programs to fisheries. Transactions of the Fourteenth North American Wildlife Conference. Pages 331-335. 1949.

In many habitats their problems are interrelated, and there is need for more joint planning and joint spending.

QUINN, I. T. Virginia wildlife program moves into high gear. Virginia Wildlife 10(9): 5-7,12, illus. September 1949.

A report on the accomplishments of the State's Commission of Game and Inland Fisheries from July 1948 through June 1949. Its work was divided among Divisions of Publications, Game, Law Enforcement, and Fish.

STERNFIELD, AARON. Conservation at the crossroads. Hunting and Fishing 26(5): 25. May 1949.

"Conservation isn't improved habitat for wildlife, it isn't restocking, it isn't predator control, it isn't pollution control, it isn't better agriculture, it isn't the wise use of our resources for making goods. It isn't any one of these things--it's all of these things. It's not the parts--it's the whole."

WILDLIFE (GENERAL)--MANAGEMENT--Continued

SWANSON, GUSTAV A. Summarization of the fourteenth North American wildlife conference. Transactions of the Fourteenth North American Wildlife Conference. Pages 612-619. 1949.

THORNTON, J. E. Bringing back the wildlife on the George Washington National Forest. Virginia Wildlife 10(6): 4-5, illus. June 1949.
The Forest has 13 wildlife management units, each with a full-time game manager. "The basis for most of the environmental improvement work on the forest is the establishment of new clearings or the restoration and improvement of existing ones, such as old fields and saw mill sites." Deer and grouse are increasing and the wild turkey is holding its own in the face of ever increasing hunter pressure.

WILDLIFE (GENERAL)--MORPHOLOGY & PHYSIOLOGY

WALTER, HERBERT E. and BAYLES, LEONARD P. Biology of the vertebrates; a comparative study of man and his animal allies. 3rd edition. 875 pages, illus. The Macmillan Co., New York. 1949. $6.00.
Through good organization, many drawings, and lively writing, the authors have produced the most entertaining and informative vertebrate biology text the abstracter has ever seen. The more than 700 drawings tell a story by themselves; and even the detailed table of contents is interesting. There are 3 parts: "The Background" (characteristics of vertebrates, classification, ecology, paleontology, anthropology, cytology, histology, embryology, pathology), "The Mechanism of Metabolism and Reproduction", and "The Mechanism of Motion and Locomotion."

WILDLIFE (GENERAL)--POPULATIONS

CRISSEY, WALTER F. The airplane in fish and game work. 20 pages, illus. New York State Conservation Department, Fish & Wildlife Information Bulletin No. 4. 1949.
The author reports on work accomplished since August 1946 during more than 800 flying hours. He discusses in detail the best type of plane and the conditions that were met in making surveys of ducks, beaver, muskrats, and deer; in law enforcement, photography, aerial counts of hunters and fishermen, and aerial counts of tracks in the snow. Deer counts from the air were unreliable; the other procedures were successful.

PETRIDES, GEORGE A. Viewpoints on the analysis of open season sex and age ratios. Transactions of the Fourteenth North American Wildlife Conference. Pages 391-410. 1949.
"The possibilities are explored for estimating rearing success, juvenile mortality, adult breeding season mortality, peaks of breeding and mating, degree of hunting pressure, pre- and post-hunting season population sizes, mortality rate, sizes of age classes among adults, turnover period and average longevity for many game and fur species from open season sex and age ratios alone, or from such ratios and supporting data. Formulas are provided for estimating the values of many of these population characteristics."

WILDLIFE (GENERAL)--POPULATIONS--Continued

SOLOMON, M. E. The natural control of animal populations. The Journal of Animal Ecology 18(1): 1-35. May 1949.

This article reviews the theories of control and outlines the essentials of natural control. Then, under the heading "Some special questions", it considers the relative importance of different factors, balance of populations, mode of variation in abundance, and other matters. There is a bibliography of about 150 items.

WILDLIFE (GENERAL)--RESEARCH

COTTAM, CLARENCE. Further needs in wildlife research. The Journal of Wildlife Management 13(4): 333-341. October 1949.

The author reviews subjects in which research has paid, and he discusses the urgent need for information on several more (effect of radioactivity on wildlife, production of upland game, lead poisoning of waterfowl, marsh management, cycles, predator-prey relationships, river basin development, fishery resources, pesticides). "The unsolved problems in wildlife and fishery management are legion, and the great complexity of many of these problems assures slow progress." "Both fundamental and applied research are essential."

LEONARD, JUSTIN W. Research man vs. administrator--the research man's viewpoint. The Journal of Wildlife Management 13(3): 237-244. July 1949.

A lively review of common misunderstandings. The public also is involved.

RIPLEY, W. ELLIS. Tagging salmon with blowgun darts. Copeia 1949(2): 97-100, illus. June 1949.

The author's experiments with temporary tagging of salmon led him to evolve a small blowgun harpoon that is useful in collecting small mammals, reptiles, and frogs. "A beginner can soon learn to hit consistently an area the size of a cigarette package at a distance of 15 feet." The maximum accurate range is about 30 feet. The dart consists of a straightened fish hook and a cork. It is attached to a coil of twine, and is projected from a 3-foot tube of half-inch electric conduit.--W. H. Stickel.

WILDLIFE (GENERAL)--VALUES

STEFANSSON, VILHJALMUR. Economic utilization of wildlife through partial or complete domestication. Transactions of the Fourteenth North American Wildlife Conference. Pages 31-35. 1949.

Man's conservatism has made him introduce cattle into environments that had native animals much better suited to domestication. Examples are the muskox in north temperate regions and the eland in Africa. A taboo against horse meat has kept him from making the best use of the horse.

MAMMALS (GENERAL)--COMMUNITIES & HABITATS

BURES, JOSEPH A. Mammals of a limited area in Maryland; an ecological study in the Bare Hills-Lake Roland area. Maryland Naturalist 18(4): 59-68, illus. Fall 1948.

The data on this Baltimore County area were collected from 1941 to 1947. The author describes and maps its geology, topography, and plant communities, and discusses the occurrence of 23 kinds of mammals.

MAMMALS (GENERAL)--DISEASES

READ, CLARK P. Studies on North American helminths of the genus Capillaria Zeder, 1800 (Nematoda): II. Additional capillarids from mammals with keys to the North American mammalian species. The Journal of Parasitology 35(3): 231-239, illus. June 1949.

MAMMALS (GENERAL)--FAUNAS & MANUALS

ORR, ROBERT T. Mammals of Lake Tahoe. 127 pages, illus. California Academy of Sciences, San Francisco 18. 1949. $4.00.

53 kinds of native mammals have been recorded from this region. The individual accounts contain a great deal of information on habits and enough on form and distribution to permit identification. There are many attractive and useful drawings.

MAMMALS--BIG GAME (GENERAL)

ANDERSON, CHESTER C. Emergency feeding in '49. Wyoming Wild Life 13(7): 4-13,37-38, illus. August 1949.

"An average of 7,426 elk, 6,767 deer, and 5,950 antelope were fed in Wyoming during the emergency period." Elk suffered only a normal loss. Deer feeding was not so successful, but it held down damage to ranches. Antelope were benefited some, but the cost was nearly prohibitive.

HUNTER, GILBERT N. and YEAGER, LEE E. Big game management in Colorado. The Journal of Wildlife Management 13(4): 392-411, illus. October 1949.

The authors give a detailed account of organization and activities. In a land-unit organization of 59 districts, seasons and limits are based on range conditions, population trends, and hunting pressure. Education has an important place in the program. Severe lack of winter range is the most serious problem. Post population counts are made by airplane; harvests are determined at checking stations and from kill cards.

MITCHELL, GLENN E. The big-game resource. Transactions of the Fourteenth North American Wildlife Conference. Pages 538-543. 1949.

"Much of the suitable game habitat is fully stocked or overstocked with native species of big game." ".....if big-game hunting is to continue as a popular sport, the herds must be put under the best known methods of management."

MAMMALS--BIG GAME (GENERAL)--Continued

REID, RUSSELL. Theodore Roosevelt National Memorial Park as a game sanctuary. North Dakota Outdoors 11(12): 4-5, 12-13, illus. June 1949.
An account of the former and present wildlife of this western North Dakota area, with comments on the feasibility of reintroducing buffalo, elk, and mountain sheep.

MAMMALS--BIG GAME (DEER)

ADAMS, LOWELL. Deer browsing on ponderosa pine. Proceedings of the Montana Academy of Sciences 7 and 8: 65-68, illus. 1948.
White-tailed deer utilize pine more than they do Douglas fir on a winter range in Lincoln Co., Montana. The inadequate pine reproduction in the area may be corrected by silvicultural practices or by reducing the deer herd.

ALDOUS, C. M. Mule deer problem areas of the western states. Transactions of the Fourteenth North American Wildlife Conference. Pages 502-512. 1949.
The author discusses, state by state, a large number of areas where deer are starving, competing with livestock, or damaging crops. Most of the states are studying these areas; and most of them have legalized the removal of antherless deer where herds are too large. Better dispersal of hunters is another way to hold down excessive populations. "Biologists and administrators must be able to recognize a problem in its early stages."

BARTLETT, I. H. Whitetail deer--United States and Canada. Transactions of the Fourteenth North American Wildlife Conference. Pages 543-553. 1949.
From a possible primitive population of 40 million, whitetails dropped to half a million in 1908, then rose again to 6 million in 1948. They occur regularly in all but 9 states and provinces. In 1947 the kill was only 58% of the estimated harvestable surplus. The remainder probably died of starvation, were shot while destroying crops, or stayed on to destroy more of their own range. Better management is imperative.

BULP, GARDINER. Deer damage control through herd management. Transactions of the Fourteenth North American Wildlife Conference. Pages 604-611. 1949.
There is considerable objection by hunters to any attempt to reduce the deer population. Farmers are demanding action because starved deer are feeding on their crops. The states are trying to convince the public that herd management is basic to effective deer damage control.--M. A. Slattery.

MAMMALS--BIG GAME (DEER)--Continued

CHEATUM, E. L. The use of corpora lutea for determining ovulation incidence and variations in the fertility of white-tailed deer. The Cornell Veterinarian 39(3): 282-291, illus. July 1949.

"The ovarian cycle of the white-tailed deer is briefly described. A technique for ovarian analysis, without the necessity of microscopic examination, is described. Corpora lutea of the current breeding season are easily distinguished. It has been found that pigmented scars of old corpora lutea of the preceding breeding season are observable for at least eight months after fawning. A count of corpora lutea of the current season and of the scars from the preceding season reveals the incidence of ovulation rates in both breeding seasons. A source of error is sometimes introduced by the occurrence of pigmented scars of luteinized follicles that failed to rupture. These, however, can be distinguished from the scars of true corpora lutea by their small size." "The most opportune time for collecting female reproductive material for study is discussed. In the latitude of New York State, collections from January through April yield the greatest quantity of information on productivity and ovulation rates. November and December material is less valuable because of delay in the appearance of easily identifiable macroscopic embryos, and delay in the onset of heat, especially among doe fawns. Among adult does, however, November and December collections are adequate for determining ovulation rates and breeding success of the preceding season, and much information on the current season accrues." --E. L. Cheatum.

GLASGOW, LESLIE LLOYD. A winter habitat study of deer in Maine. Master's thesis, University of Maine, 1948 (copied from an anonymous abstract in Journal of Forestry for April 1949, page 299).

An investigation of 22 deer yards in western and southern Maine during the winters of 1946-1947 and 1947-1948 showed that food conditions were good in slightly more than one-third, fair in an equal number, and poor in slightly more than one-fourth. 14 important browse species (white cedar, balsam, maples, etc.) are listed.

GRAHAM, ARTHUR. It's time to scrap the buck law! Outdoor Life 104(3): 42-44, 102-103, illus. September 1949.

The author compares conditions in states that have stuck longest and closest to the buck law with conditions in states that have been realistic enough to permit the killing of does and fawns. He comes to the conclusion expressed in the title of the article. All other measures have been attempts to fit the range to a herd too big for it; while what is needed is to cut the herd to fit its range.

MAMMALS--BIG GAME (DEER)--Continued

HAHN, HENRY C., JR. A method for censusing deer and its application in the Edwards Plateau of Texas. 24 pages, illus. Texas Game, Fish and Oyster Commission, Austin. February 1949.

Walking cruises were more satisfactory than riding cruises when tested in Mason and Kerr Counties. Airplane counts were unsatisfactory. The last hour of daylight when relative humidity was under 70% and the sky not over half overcast was the best time for counts. October 15 to January 15 was the best period. A 2-mile cruise line was sufficient when located so as to include correct proportions of terrain features, cultivated land, and grazing pressure. Gillespie County was estimated to have approximately 35,000 deer. "The only immediate practical solution to the range and wildlife management problem in Gillespie County lies in a more adequate deer harvesting program in conjunction with sound livestock management."

HALLORAN, ARTHUR F. and KENNEDY, CECIL A. Bighorn--deer food relationships in southern New Mexico. The Journal of Wildlife Management 13(4): 417-419. October 1949.

Deer and bighorn compete for food on the San Andres National Wildlife Refuge, Dona Ana Co., New Mexico. Each is increasing. "To date the range has remained in good condition and will remain so as long as buck and doe deer.....continue to be controlled by removal from the range under the supervision of the cooperating Federal and State agencies."

HAHAFFEY, JUANITA. Winter deer trapping. Oklahoma Game and Fish News 5(2): 8-10, illus. February 1949.

An account of the transplanting of whitetails from the Wichita Mountains to depleted range in eastern Oklahoma.

POWELL, STEPHEN E. Crop protection through a new deer repellent spray. Transactions of the Fourteenth North American Wildlife Conference. Pages 567-576. 1949.

Destruction of farm crops (beans, cucumbers, strawberries, and grain) by deer has been increasing in the past few years. In 1947 the State paid out about $60,000 on more than 900 complaints. Four methods of handling the problem exist: Paying damage claims, eradication of the deer, fencing, and repellents. Paying damage claims is an easy way out but does not solve the problem. Eradication is almost impossible, and fencing is too expensive. From all indications, repellents may be the answer to the problem. One of these, Goodrite z. a. c. combined with Goodrite p.e.p.s. was tested on several plots with good results.--W. A. Slattery.

RASMUSSEN, D. IRVIN and GAUFIN, DAVID T. Managing Utah's big-game crop. Pages 573-580 in "Trees; the yearbook of agriculture, 1949." Superintendent of Documents, Washington 25, D. C. $2.00.

Early in the 20th century all big game was scarce in Utah; but under protection deer have become more abundant in recent years than ever before. The authors discuss deer and elk problems.

MAMMALS--BIG GAME (DEER)--Continued

SEVERINGHAUS, C. W. Deer hunting possibilities in New York as indicated by distribution of hunters, deer range, legal kill in 1946. New York State Conservationist 4(2): 22-25, illus. October-November 1949.
Hunting pressure was probably too heavy in some counties; it was too light in others. The author suggests changes that should make an adequate harvest more general.

SMITH, ARTHUR D. Effects of mule deer and livestock upon a foothill range in northern Utah. The Journal of Wildlife Management 13(4): 421-423, illus. October 1949.
One of 2 areas studied was heavily grazed by milk cows and horses through spring and early summer; the other area was heavily grazed by deer in winter and early spring but had had no livestock for 11 years. Perennial forbs were much more prominent and perennial grasses were more vigorous and more abundant in the area without livestock. Sagebrush was much more vigorous and abundant in the livestock pasture.

SMITH, JUSTIN G. Deer forage observations in Utah. The Journal of Wildlife Management 13(3): 314-315. July 1949.
Utilization of forage by mule deer was very light in Pole and Rock Canyons, near Provo, in the summer and early fall of 1947. Regardless of availability, the volume of forbs used was 3 times that of browse. Smilacina racemosa and Aster engelmanni were the most used forbs and rose the most used shrub.

MAMMALS--BIG GAME (ELK & ANTELOPE)
(See also MAMMALS--BIG GAME (DEER), Rasmussen & Gaufin)

HANSCUM, CHARLES W. Elk census techniques. Wyoming Wild Life 13(7): 28-30. August 1949.
In Wyoming they comprise a year-round appraisal of the population and an aerial census in February and March.

RASMUSSEN, D. I. The American elk or wapiti--today. Transactions of the Fourteenth North American Wildlife Conference. Pages 513-526. 1949.
From an original population of possibly 10 million, elk dropped 50,000-70,000 early in the 20th century, then increased to about 250,000. They are now ".....found near optimum numbers in much of the present truly suitable ranges." Tables show the status of the population by subspecies and by states and give recent figures on the kill and the number of hunters. The author discusses restoration of herds and present management problems. The latter involve recognition that because of the development of farming elk never can approach their primitive numbers, that they must not exceed the carrying capacity of the ranges, and that there must be recognition of the needs of other big game and of livestock.

THOMPSON, W. K. Predation on antelope. The Journal of Wildlife Management 13(3): 313-314. July 1949.
Several observations of predation by golden eagles and coyotes were made in 1947 and 1948.

MAMMALS--BIG GAME (MOOSE, CARIBOU, ETC.)

BANFIELD, A. W. F. The present status of North American caribou. Transactions of the Fourteenth North American Wildlife Conference. Pages 477-491, illus. 1949.

Woodland, Selkirk, and Ungava caribou have recently been seriously reduced in range and populations. Changing habitat conditions caused by spreading agriculture, lumbering operations, and forest fires are thought to be the principal causes. Locally, hunting pressure has also been a cause of decrease.—H. A. Slattery.

DUFILLY, ARTHUR E. A bibliography of reindeer, caribou, and musk-ox. 462 pages, U. S. Department of the Army, Office of the Quartermaster General, Environmental Protection Section, Report No.129. May 1949.

This bibliography of 2422 items is based on research in about 50 libraries. It is the only comprehensive bibliography in English on these mammals. There are references to libraries where the different works are available; many explanatory notes, including page references; lists of vernacular and technical names; a discussion of Russian literature; and other useful information. The bibliographic section separates books, periodicals, and government publications of Canada, Russia, and United States. There is a detailed index.

HARGRAVE, HARRY. Canada's reindeer range. Canadian Cattlemen 10(4): 226-227,254, illus. and 11(1): 24-25,33. March and June 1948.

A lively account of the 6600-square mile reindeer reserve on the east side of the MacKenzie Delta: the general environment, the annual roundup, the winter range, and many other details.

HATTER, JAMES. The status of moose in North America. Transactions of the Fourteenth North American Wildlife Conference. Pages 492-501. 1949.

"Generally throughout Canada moose are not as abundant as they were 20 or more years ago." Overpopulation and the poorer environment produced by forest regeneration appear to be important limiting factors in many areas. Carrying capacities should be determined and annual surpluses removed. Moose are holding their own in Alaska.

HOSLEY, N. W. The moose and its ecology. 51 pages illus. U.S.D.I., Fish and Wildlife Service, Wildlife Leaflet 312. October 1949.

The author reviews moose life history, behavior, ecology, and management. Good management requires a reliable inventory. Where populations are low in old forests, scattered cuttings will increase the amount of browse. Where they are high, browse surveys are needed. Moose should be killed only through controlled hunts.

MAMMALS--BIG GAME (MOOSE, CARIBOU, ETC.)--Continued

SCHORGER, A. W. The black bear in early Wisconsin. Transactions of the Wisconsin Academy of Sciences, Arts and Letters 39: 151-194. 1949.

Black bear have been reported in every county, but their present range (1946) is the northern half of the State. The last report in the southern half of the State was in 1909, except for 9 central Wisconsin counties which reported bear as late as 1944-1946. Indians hunted bears either with log dead-falls or by smoking them out of their dens and shooting them; white men typically used steel traps. The 9-12-ounce young are born in January and February, after a 7-7½-month gestation period. Litters range from 1 to 5. Breeding probably occurs every 2 years, due to antagonism of adult males to cubs still with their mother in their first summer. Dens are usually in hollow trees and logs, in caves, underneath a windfall, or dug in the ground. Occasionally bears winter in the open. Early literature frequently records the fallacious opinion that bears move south in the winter. Seasonal migrations over regular trails and passes or concentrations due to food abundance do occur. An appendix gives the references from which were obtained the last dates of appearance in the southern counties, and a chronology of food conditions in Wisconsin, including acorn mast and various berries and wild fruits. There is a bibliography of 248 titles.—Fred H. Wagner.

MAMMALS--BIG GAME (MOUNTAIN SHEEP & MOUNTAIN GOAT)
(See also MAMMALS--BIG GAME (DEER), Halloran & Kennedy)

CASEBEER, ROBERT L. Food habits of mountain goats in western Montana (Abstract). Proceedings of the Montana Academy of Sciences 7 and 8: 69. 1948.

Summer and winter food habits were studied. They were too diverse for ready summarization.

HALLORAN, ARTHUR F. Desert bighorn management. Transactions of the Fourteenth North American Wildlife Conference. Pages 527-537. 1949.

"This paper pertains chiefly to the management procedures now in effect on the Kofa Game Range in southwestern Arizona." These procedures involve water development, domestic stock management, feral stock management, deer management, predator control, patrol work, and educational work. Deer are increasing and providing better hunting in adjacent areas. Bighorns are healthy and increasing.

MAMMALS--FURBEARERS (GENERAL)

ANONYMOUS. Publications on fur animals and trapping. 4 pages. U. S. D. I. Fish and Wildlife Service, Wildlife Leaflet 322. August 1949.

In separate lists are publications of the United States Department of the Interior; other publications on fur animals and the fur trade; publications on trapping; and American, Canadian, and European periodicals.

MAMMALS--FURBEARERS (GENERAL)--Continued

CHEATUM, E. L. and COOK, ARTHUR H. On the occurrence of the North American guinea worm in mink, otter, raccoon, and skunk in New York State. The Cornell Veterinarian 38(4): 421-423, illus. October 1948.
Published occurrences of the North American guinea worm in carnivores of New York State are reviewed. With the hosts added in the present report they include raccoon, Bonaparte weasel, otter, mink, and skunk. The worms were identified as Dracunculus insignis (Leidy, 1858). Measurements and descriptions of the worms are given.--E. L. Cheatum.

COOK, ARTHUR H. Factors to consider in trapping regulations. 4 pages. New York State Conservation Department, Fish & Wildlife Information Bulletin No. 1. 1948.

NEUBRECH, WALTER. Predator control policy of the Washington State Department of Game. The Murrelet 30(2): 37-39. May-August 1949.
In 1945 the State added 15 predator hunters to its staff. They have succeeded in greatly reducing the magpie population and, locally, the skunk and coyote populations. Bounty payments have been continued, although they did not decrease the predator population.

PETERSON, RANDOLPH L. and CRICHTON, VINCENT. The fur resources of Chapleau District, Ontario. Canadian Journal of Research D, 27(2): 68-84, illus. April 1949.
This district is 100-150 miles east of Lake Superior. It is roughly 60 by 190 miles in extent and has an area of more than 6000 square miles. Records of legally caught furs have been made for the seasons 1941-42 to 1946-47. "From these records the area required to produce one harvested animal has been computed for most species." The figures should be useful to persons concerned with fur production and to students of animal populations. The average annual value of the furs was $74,000. The authors describe the area and discuss 16 species of mammals. The Chapleau Crown Game Preserve may be influencing the catch of marten and fisher in nearby territories.

PRESNALL, CLIFFORD C. Policies and philosophies of predator and rodent control. Transactions of the Fourteenth North American Wildlife Conference. Pages 586-592. 1949.
There is a definite need for predator and rodent control but not without research.--M. A. Slattery.

QUORTRUP, E. R. and GORHAM, J. R. Susceptibility of furbearing animals to the toxins of Clostridium botulinum Types A, B, C, and E. American Journal of Veterinary Research 10(36): 268-271. July 1949.
Experiments with mink and ferrets indicate moderate susceptibility to the toxins of types A and B, high susceptibility to type C, and apparent immunity to type E. Muskrats were also susceptible to botulinus toxin; foxes, coyotes, and wildcats were immune.

MAMMALS--FURBEARERS (BEAVER)

CONIBEAR, FRANK and BLUNDELL, J. L. The wise one. 265 pages, illus. William Sloane Associates, New York. 1949. $2.75.

The life of beavers, in story form, with much about their environment (water, vegetation, man, other animals). Frank Conibear says: "At some time or other in my trapping career of thirty-two years I have seen, or seen the evidence of, all the incidents related herein, and the story may be regarded as true in all its detail."

ERICKSON, ARNOLD B. The fungus (Haplosporangium parvum) in the lungs of the beaver (Castor canadensis). The Journal of Wildlife Management 13(4): 419-420, illus. October 1949.

This organism has been found in several rodents. The author believes that heavy infections are certain to be pathogenic.

HODGDON, KENNETH W. Productivity data from placental scars in beaver. The Journal of Wildlife Management 13(4): 412-414. October 1949.

This study of 155 beaver carcasses in Maine ".....showed 39 as adult females, 20 of which had placental scars. An average of 3.95 placental scars was found for the females pregnant in 1947. In three litter and eight embryo counts, the average number of young was 3.55."

MANVILLE, RICHARD H. The fate of Morgan's beaver. The Scientific Monthly 69(3): 186-191, illus. September 1949.

Lewis H. Morgan made a detailed study of beaver in the vicinity of Ishpeming, upper peninsula of Michigan, in the middle of the nineteenth century. Manville appraised the area in 1948 and found that civilization had nearly destroyed the population that appeared to Morgan to have existed for centuries. This would not have happened if man had been at least tolerant of beaver.

SHANK, WENDELL G. Beaver ecology and management in West Virginia. 65 pages, illus. Conservation Commission of West Virginia, Division of Game Management, Bulletin No. 1. 1949.

Beaver were reintroduced in West Virginia between 1933 and 1940, and now are about as common in the State as desirable. They are principally in the Allegheny Plateau. Serviceberry is their favorite food. They benefit muskrat, raccoon, mink, waterfowl, and woodcock, but destroy winter cover for deer and grouse. They are a local problem with respect to trout. They should be confined to about their present range and population by the annual removal of about 700 animals. A cooperative management plan is in operation on the Monongahela National Forest.

MAMMALS--FURBEARERS (MUSKRAT)

COULTER, MALCOLM WILFORD. A study of movements and habitat preferences of muskrats in Maine. Master's thesis, University of Maine, 1948 (copied from an anonymous abstract in Journal of Forestry for April 1949, page 291)

"Control of the water level and the creation of artificial pools and channels are suggested as simple measures to increase the natural productivity of the marsh for muskrats."

MAMMALS--FURBEARERS (MUSKRAT)--Continued

REILLY, JAMES RICHARD. A study of the metazoal parasites of the Maine muskrat. Master's thesis, University of Maine, 1948 (copied from an anonymous abstract in Journal of Forestry for May 1949, page 391).
91 of 126 muskrats from eastern and south-central Maine were infested with trematodes (7 species); 61 with mites (1 species); 43 with cestodes (2 species); and 21 with nematodes (2 species). "Maintenance of optimum water level and controlled burning are suggested as the only possible means of control and reduction of the incidence of parasitism."

MAMMALS--FURBEARERS (FOXES, RACCOON, ETC.)
(See also MAMMALS--RODENTS (DOMESTIC RAT), Emmons and others; BIRDS--UPLAND GAME (BOBWHITE), Marsh)

de VOS, A. The value of the timber wolf bounty systems to northern Ontario. Sylva 5(1): 15-23, illus. January-February 1949.
They have little value except in settled areas where wolves menace livestock; and experienced wolf trappers would do more good in such areas.

HOOPER, ELLET T. and OSTENSON, BURTON T. Age groups in Michigan otter. Occasional Papers of the Museum of Zoology, University of Michigan, No. 518. 22 pages. March 1949.
The authors measured the skulls of 139 and the bacula of 22 Michigan otter taken in the early 1940's. They found males slightly more variable and significantly larger than females. Teeth were relatively free from decay. Sexually adult animals made up more than one-half of the sample.

JONES, JOHN C. Skunks and how to control them. Pests and their control 17(2): 9-11, illus. February 1949.
"Skunks are mostly beneficial to man"; but sometimes they are a nuisance and sometimes they destroy poultry, eggs, and bees. The author tells how to keep them out of places where they are not wanted and how to trap them.

MORAN, P. A. P. The statistical analysis of the sunspot and lynx cycles. The Journal of Animal Ecology 18(1): 115-116, illus. May 1949.
There appears to be no causal connection between the sunspot and Canada lynx cycles.

PETRUSKA, MICHAEL. The dog problem: dogs and conservation. New York State Conservationist 4(1): 2. August-September 1949.
In New York State there is a growing horde of homeless dogs that are a menace to wild and domestic animals. One of the principal problems is of dogs running deer. Present laws and sentiment make dog control impossible. More complete licensing is needed. A short quarantine period each year for licensed dogs would permit the effective rounding up of unlicensed dogs.

ANIMALS--FURBEARERS (FOXES, RACCOON, ETC.)--Continued

SHELDON, WILLIAM G. A trapping and tagging technique for wild foxes. The Journal of Wildlife Management 13(3): 309-311, illus. July 1949.
Steel traps with padded or blunted jaws were successful in catching large numbers of foxes. A light, spring metal collar was used for tagging.

TITCHELL, ALLEN REED and DILL, HERBERT H. One hundred raccoons from one hundred and two acres. Journal of Mammalogy 30(2): 130-133. May 1949.
This is believed to be the highest harvest on record. The coons were taken in 4½ days in January 1948 from the Swan Lake National Wildlife Refuge, Chariton Co., Missouri. They were released 250 miles away. The authors give data on the hunt, habitat, weights, sex, etc.

ANIMALS--RODENTS (GENERAL)
(See also ANIMALS--FURBEARERS (GENERAL), Presnall)

CHITTY, DENNIS and KEMPSON, D. A. Prebaiting small mammals and new design of live trap. Ecology 30(4): 536-542, illus. October 1949.

KREIGER, CARL H. Compound 42, a new anticoagulant as a rodenticide. Pests and their control 17(5): 24-28. May 1949.
A multiple dose technique causes death from internal hemorrhages. The author reviews the experiments leading to the use of compound 42 and lists its advantages (very low dosages are required; it is palatable; slow action prevents bait shyness; there apparently is no sex or age difference in its effectiveness; it does not cause development of tolerance; it is effective against rats and mice; its effectiveness does not vary; it is relatively nontoxic to cats and dogs).

LAY, GEORGE B. Rodent control in processing plants. Pests and their control 16(2): 28-32. February 1948.
Essentials of rodent control in food establishments are (1) cleanliness, (2) proper stacking of commodities, (3) ratproofing and mouseproofing, (4) periodic killing, and (5) periodic survey of conditions.

STORER, TRACY I. Control of field rodents in California. 51 pages, illus. California Agricultural Extension Service, Circular 138. August 1947.
This circular ".....describes control methods that have proved successful in the hands of many users. It deals with ground squirrels, tree squirrels, pocket gophers, muskrats, rabbits, meadow mice, and kangaroo rats; also moles." Field rodents destroy millions of dollars worth of crops every year, and some of them carry bubonic plague, tularemia, and other serious diseases. Effective control involves understanding rodent habits, putting this knowledge to use, and keeping at control throughout the year.

MAMMALS--RODENTS (DOMESTIC RAT)
(See also MAMMALS--RODENTS (GENERAL), Lay)

DAVIS, DAVID E. Principles of rat management. Pests and their control 16(11): 9-12, illus. November 1948.

Management involves an understanding of (1) the forces (reproduction, mortality, migration) which act upon a population, (2) the rate of growth of a population, and (3) the balance. The only permanently effective control measure is sanitation.

DAVIS, DAVID E. The role of intraspecific competition in game management. Transactions of the Fourteenth North American Wildlife Conference. Pages 225-231, illus. 1949.

Competition within a species may have far-reaching effects on populations. The brown rat which has been studied for about 5 years in Baltimore is an example of this. It was found that "After a reduction of population the pregnancy rates and size of the survivors increased. Continuous removal of rats resulted in an increase in average weight of the remainder." "As a hypothesis for use in predicting the effect of specific management practices it is suggested that: To manage population, alter the environment so that intraspecific competition will change inversely to the desired change in population."--H. A. Slattery.

EMLEN, JOHN T., JR. Baltimore's community rat control program. American Journal of Public Health 37(6): 721-727, illus. June 1947.

"Four-fifths of the residential blocks of Baltimore have been treated one or more times in the eighteen months since the start of the full-fledged program in January, 1945. All work is done on an areal unit basis, the square city block being the unit employed. ANTU in ground yellow corn is used as the standard poison bait. Community sanitation and rat proofing are encouraged....." Well-conducted block campaigns usually resulted in 85% to 95% reductions. Repeat campaigns once a year will hold a population well below its original level and reduce annual damage by about two-thirds.

EMLEN, JOHN T., JR. and STOKES, ALLEN W. Effectiveness of various rodenticides on populations of brown rats in Baltimore, Maryland. The American Journal of Hygiene 45(2): 254-257, illus. March 1947.

5 poisons were tested on confined rats and gave good kills. 3 of them were selected as reasonably safe for use in residential communities and were exposed to free-living rats. Of these, only ANTU gave good kills. It worked best with a combination of several bait bases.

EMLEN, JOHN T.; STOKES, ALLEN W.; and DAVIS, DAVID E. Methods for estimating populations of brown rats in urban habitats. Ecology 30(4): 430-442, illus. October 1949.

Urban rat populations are split into units that coincide with city blocks. The only absolute measure of population size is the capture and removal of all the rats in an area. Of indirect census methods, ".....the survey of signs is the most convenient and often the most reliable." "The measurement of food consumption at bait stations proved useful as a supplement to sign surveys...." Trapping success was an unreliable index of population size.

MAMMALS—RODENTS (DOMESTIC RAT)—Continued

EMMONS, C. W.; MORLAN, H. B.; and HILL, E. L. Histoplasmosis in rats and skunks in Georgia. Public Health Reports 64(45): 1423-1430, illus. November 11, 1949.

Histoplasma capsulatum was isolated from 7 brown rats, 4 roof rats, and 5 spotted skunks in southwestern Georgia in 1948 and 1949. These strains were pathogenic for mice. "No significant relationship between human and animal histoplasmosis has yet been observed."

MORLAN, HARVEY B. Ectoparasites of domestic rats and mice and the diseases they transmit. Pests and their control 16(12): 16-20, illus. December 1948.

The commonest ectoparasites are a rather large number of species of fleas, lice, mites, and ticks. The most important diseases are endemic typhus and plague.

STORER, TRACY I. Control of rats and mice. 37 pages, illus. California Agricultural Extension Service, Circular 142. April 1948.

The author discusses Norway, roof, and black rats, house mice, white-footed mice, and wood rats. They cause extensive damage and carry plague, murine typhus, leptospirosis, food poisoning, rat-bite fever, trichinosis, and rickettsialpox. "The principal means of controlling rats and mice are (1) exclusion, (2) traps, (3) poisoned baits, and (4) poisonous gases or dusts." "Exclusion is the real solution,....."—M. A. Slattery.

TRYON, CLARENCE A., JR. The Norway rat and plague in Montana (Abstract). Proceedings of the Montana Academy of Sciences 5 and 6: 47. 1946.

"As yet the ranges of the rat and the plague have not overlapped in Montana but it is now probable that they will in the near future."

WHITAKER, NORTON G. How we ran Toronto's rodent control program. Pests and their control 17(6): 16-20. June 1949.

This long-term campaign of the citizens Volunteer Rodent Control Committee has been handicapped by lack of proper legislation and by public apathy. The Committee ran a rodent control school early in 1949; got the cooperation of pest control operators; and poisoned with fortified red squill.

MAMMALS—RODENTS (SQUIRRELS, POCKET GOPHERS, ETC.)

DURRANT, STEPHEN D. The pocket gophers (Genus Thomomys) of Utah. University of Kansas Publications, Museum of Natural History 1(1): 1-82, illus. August 1946.

A systematic account of 24 subspecies of bottae and 11 subspecies of talpoides. A map shows their distribution.

ANIMALS--RODENTS (SQUIRRELS, POCKET GOPHERS, ETC.)--Continued

FITCH, HENRY S. and BENTLEY, J. R. Use of California annual-plant forage by range rodents. Ecology 30(3): 306-321, illus. July 1949.
This study was made at the San Joaquin Experimental Range, Madera Co., California, between 1935 and 1947. 3 of 4 enclosed pens were stocked, respectively, with ground squirrels, pocket gophers, and kangaroo rats. Each species was highly destructive, particularly during the green-forage season. They destroyed (more by other activities than by feeding) up to one-third of the annual herbage crop; but would destroy less on free range where the species were competing with one another and with livestock.

HICKS, ELLIS A. Ecological factors affecting the activity of the western fox squirrel, Sciurus niger rufiventer (Geoffroy). Ecological Monographs 19(4): 287-302, illus. October 1949.
This investigation was made on 250 acres in central Iowa from 1938 to 1941 and from 1946 to 1947. The author determined the times of greatest activity according to time of year and time of day; and according to relative humidity, wind, cloudiness, rain, and snow. Fox squirrels were most active in late fall, on clear, still days.

INGLES, LLOYD G.; CLOTHIER, RONALD; and CRAWFORD, LOUIS A. Methods of estimating pocket gopher populations. The Journal of Wildlife Management 13(3): 311-312. July 1949.
Early in 1948 the authors studied the pocket gopher population of 2 one-acre plots in Fresno Co., California. Strip counting would not work because of the closeness of the runs to each other. A population index method that had been used successfully with birds, snowshoe hares, and Peromyscus did not give accurate estimates of the populations.

JONES, JOHN C. Squirrels can be pests. Pest Control 17(11): 8-14, illus. November 1949.
The author reviews the habits of gray, fox, red and flying squirrels, and chipmunks. They are nuisances principally to plant growers and city householders. Buildings can be proofed against them; plants can be protected by removal of squirrels through live trapping or by lawful shooting, trapping or poisoning.

OSBORN, BEN and ALLAN, PHILIP F. Vegetation of an abandoned prairie-dog town in tall grass prairie. Ecology 30(3): 322-332, illus. July 1949.
A prairie-dog colony on the Wichita Mountains Wildlife Refuge, Comanche Co., Oklahoma which was abandoned in 1946 shows 7 concentric vegetation zones. They range from mat forbs next to the colony to climax tall grasses at the periphery of the area. "In the tall grass type, prairie-dogs are 'animal weeds', and, like grasshoppers and jack rabbits, can be excluded or reduced by the use of a barbed-wire fence to keep out livestock."

MAMMALS--RODENTS (SQUIRRELS, POCKET GOPHERS, ETC.)--Continued

ROE, EUGENE I. Effect of red squirrels on red pine seed production in off years. Journal of Forestry 46(7): 528-529. July 1948.
Observations in northeastern Minnesota lead the author to conclude that ".....the cutting off of conelets by red squirrels along with mature cones is likely responsible to a considerable degree for light crops and failures."

SCHEFFER, THEO. H. Ecological comparisons of the plains prairie-dog and the Zuni species. Transactions of the Kansas Academy of Science 49(4): 401-406, illus. March 1947.

SCHORGER, A. W. Squirrels in early Wisconsin. Transactions of the Wisconsin Academy of Sciences, Arts and Letters 39: 195-247. 1949.
Red squirrels, now losing ground in southern Wisconsin, formerly ranged throughout the state. Their persistence in southeastern Wisconsin is apparently due to remnants of tamarack swamps. Fox squirrels are less numerous than grays. They were not common in early Wisconsin. Records of fox squirrel emigrations are few. Increase northward of the gray squirrel is induced by agriculture and the replacement of conifers by hardwoods. The frequent emigrations of tremendous numbers of gray squirrels, characterized by persistence in adhering to their set courses, have occasionally been simultaneous with bear and turkey emigrations. Squirrels of some emigrations have been heavily infested with warble fly larvae or mange mites. It is believed that populations and movements are governed by the food supply. An appendix lists Wisconsin emigrations and gives a chronology of food conditions. There is a bibliography of 206 titles.--Fred H. Wagner.

SHORTEN, MONICA. Grey squirrels in Britain. The New Naturalist 1: 42-46. 1948.

VILLA-R., BERNARDO and HALL, E. RAYMOND. Subspeciation in pocket gophers of Kansas. University of Kansas Publications, Museum of Natural History 1(11): 217-236, illus. November 1947.
5 subspecies of Geomys bursarius are discussed. They occur in all but the southeast corner of the State.

MAMMALS--RODENTS (MICE, ETC.)
(See also MAMMALS--RODENTS (DOMESTIC RAT), Norlan; Storer)

BODENHEIMER, F. S. Problems of vole populations in the Middle East: report on the population dynamics of the Levant vole (Microtus guentheri D. et A.). 77 pages, illus. The Research Council of Israel, Jerusalem. 1949.
5 shillings through Interscience Publishers, Inc., New York 3, N. Y.
This species is responsible for the major vole outbreaks in the Middle East. The author has been occupied with research on vole control almost every year since 1922. He writes in detail of vole biology, enemies, physiology, populations and their fluctuations, damage, and control.

ANIMALS--RODENTS (MICE, ETC.)--Continued

HOWARD, WALTER E. Dispersal, amount of inbreeding, and longevity in a local population of prairie deer mice on the George Reserve, southern Michigan. 50 pages, illus. Contributions from the Laboratory of Vertebrate Biology No. 43. April 1949. 50¢ from University of Michigan Press.

IVES, HARLEY B. House mice and their control. Pests and their control 16(10): 11-18, 54, illus. October 1948.
This article describes mouse habits, damage, mouse proofing, poisons, and repellents.

SCHMIDT-NIELSEN, BODIL and KNUT. The water economy of desert mammals. The Scientific Monthly 69(3): 180-185, illus. September 1949.
Kangaroo rats and pocket mice thrive without water for several weeks under experimental conditions. They spend no water for heat regulation; they excrete highly concentrated urine; and they evaporate water from the lungs at a lower rate than white rats.

ANIMALS--RABBITS

BROWN, H. LEO. Coaction of jack rabbit, cottontail, and vegetation in a mixed prairie. Transactions of the Kansas Academy of Science 50(1): 26-44, illus. June 1947.
This study was made in the early 1940's on a 550-acre tract near Hays, Kansas. Jack rabbits were most abundant on grazed areas; cottontails in a mixture of taller grasses, weeds, and shrubs. Jack rabbits and cottontails each ate more than 30 species of plants. Many seeds in fecal pellets were viable. The authors believe that rabbits help in establishing prairie plants in abandoned cultivated fields and denuded range land.

DUSI, JULIAN L. Methods for the determination of food habits by plant microtechniques and histology and their application to cottontail rabbit food habits. The Journal of Wildlife Management 13(3): 295-298, illus. July 1949.
The author describes in detail a method for making mounts of plant epidermis from which photomicrographs were made. He also describes the procedure for sampling droppings and identifying the components of pellets by comparison with the photomicrographs.

MORGAN, BANNER BILL. Tularemia in Wisconsin. Transactions of the Wisconsin Academy of Sciences, Arts and Letters 39: 1-19. 1949.
"A total of 459 human cases of tularemia have been recorded from 61 counties in Wisconsin over a 19-year period (1928-1946). Approximately 67 per cent of the cases were derived from direct contact with rabbits. The mortality rate was 4.1 per cent. Of the four clinical types of tularemia, 114 patients had the ulceroglandular type (22.4 per cent), 136 patients had the glandular type (30.4 per cent), 88 patients contracted the typhoidal type (19.6 per cent) and only 6 cases (1.2 per cent) had the oculoglandular tularemia. Due to incomplete records, 114 cases (22.4 per cent) were listed as unclassified. Over one half of the cases occurred in ten counties:

MAMMALS--RABBITS--Continued

Milwaukee (41), Rock (36), Douglas (36), Dane (29), Green (25), Lafayette (16), Marathon (14), Ashland (14), Dodge (12) and Grant (12). Tularemia is somewhat seasonal with November the high month, which coincides with the hunting season. The high year was 1939 with 54 cases."--H. A. Slattery.

OLSEN, O. WILFORD. Wild rabbits as reservoir hosts of the common liver fluke, Fasciola hepatica, in southern Texas. The Journal of Parasitology 34(2); 119-123. April 1948.

Flukes were found in 99 of a total of 309 jack rabbits collected in Refugio County throughout the year. They were less common in cottontails. Rabbits, thus, complicate the control of liver flukes in cattle and sheep.

SWEETMAN, HARVEY L. Further studies of the winter feeding habits of cottontail rabbits. Ecology 30(3): 371-376. July 1949.

"A summary of the data from 1942 to 1948 indicates that 64 species in 22 families are sufficiently susceptible to winter feeding by cottontail rabbits as to be extensively injured, at least under certain conditions....." ".....30 species in 9 of these families seemed to be relatively free of winter attack by the rabbits."

MAMMALS--INSECT-EATERS

JONES, JOHN C. How to control bats. Pests and their control 16(12): 7-8, illus. December 1948.

JONES, JOHN C. Mole control in eastern United States. Pests and their control 16(10): 23-28, illus. October 1948.

Trapping is the most generally satisfactory method of control. The author describes this and other methods.

NYBERG, OLOF. Studies on bats and bat parasites. 330 pages, illus. Univ. Lund and Zool. Lab. Agr., Dairy, and Hort. Inst. of Alnarp. Stockholm, Sweden. date? (copied from Science for April 22, 1949, page 413).

A review by Neal A. Weber says that this book is largely on the natural history of Scandinavian bats, but that its information is equally relevant to the study of North American bats. World-wide distribution is shown by maps. A 41-page bibliography deals with world literature.

SCHEFFER, THEO. H. Ecological comparisons of three genera of moles. Transactions of the Kansas Academy of Science 52(1): 30-37, illus. March 1949.

The author draws on English literature and his own field studies for comparisons of the British Talpa, the eastern American Scalopus, and the western American Scapanus.

MAMMALS--MARINE

COLMAN, J. S. The Newfoundland seal fishery and the second world war. The Journal of Animal Ecology 18(1): 40-46, illus. May 1949.
"Newfoundlands' fleet of sealing steamers was virtually finished by the second World War, and in 1943, for the first time in 150 years or so, there was no seal hunt. Since then a successful new start has been made with smaller motor-vessels. In 4 years the fishery has been built up almost to what it was between the wars, and the very high catches per man show that there are plenty of seals." "The seals do not seem to be in any danger of overfishing, at any rate during the next decade." A map of Newfoundland and its environs shows the usual breeding areas of harp and hood seals.

DAY, ALBERT M. Old man of the Pribilofs. The Scientific Monthly 68(5): 329-337, illus. May 1949.
An account of the biology, protection, and use of the Pribilof Islands fur seals.

SCHEFFER, VICTOR B. and ASHBROOK, FRANK G. Conserving the Alaska fur seals. Transactions of the Fourteenth North American Wildlife Conference. Pages 440-450, illus. 1949.
The Federal government conserves the Pribilof Island seals by restricting the total number of seals killed, confining the kill to males of a single age, carrying out the kill in a selected season of the year, and utilizing waste products. Research and careful management have made sealing an industry representing a capital investment of 100 million dollars.--M. A. Slatery.

BIRDS (GENERAL)--BEHAVIOR

ROBBINS, CHANDLER S. Weather and bird migration. The Wood Thrush 4(4): 130-144, illus. March-April 1949.
The author discusses the effects on bird migration of weather--particularly temperature, barometric pressure, and wind direction. He also describes the way in which different groups of birds react to weather conditions. Many examples make the article of interest to bird watchers of a wide area in the East, as well as to those of the Washington, D. C. region.

BIRDS (GENERAL)--COMMUNITIES & HABITATS
(See BIRDS--CRANES & RAILS, Walkinshaw)

BIRDS (GENERAL)--DISEASES

READ, CLARK P. Studies on North American helminths of the genus Capillaria Zeder, 1800 (Nematoda): III. Capillarids from the lower digestive tract of North American birds. The Journal of Parasitology 35(3): 240-249, illus. June 1949.
With keys.

BIRDS (GENERAL)--DISEASES--Continued

NORTH, C. BROOKE. Birds and human disease. The Wilson Bulletin 61(3): 183-186. September 1949.

There are but few cases in which birds are carriers of disease or in which they form the intermediate host for human parasites. The most serious disease carried by birds is probably encephalitis. Various forms of this disease which is transmitted chiefly by mosquitoes affect both man and birds and, therefore, might be carried from one place to another by birds. Ornithosis, a virus pneumonia, is found in city pigeons and also in members of the parrot tribe which may transmit it to humans. The author mentions an interesting possibility of local control of the spread of the serious human disease schistosomiasis in the Nile Valley by ibises, which eat the intermediate host snails.--John W. Aldrich.

BIRDS (GENERAL)--FAUNAS & MANUALS

HARVEY, M. DALE. A check-list of the birds of Idaho. University of Kansas Publications, Museum of Natural History 1(10): 193-216. November 1947.

The author gives distribution and abundance for 292 kinds of birds. The data are based on his field work from 1938 to 1944 and on about 80 published reports.

BUECHNER, HELMUT K. Birds of Kerr County, Texas. Transactions of the Kansas Academy of Science 49(3): 356-364, illus. December 1946.

Residential status lists of 248 species indicate their relative abundance. Brief discussions cover environment and geographical distribution.

CHAMBERLAIN, GLEN D. The birds of Aroostook County. Bulletin of the Maine Audubon Society 5(3): 43-58. July 1949.

The records for this annotated list of 182 species were gathered through the years since 1925.

EMERSON, GUY. A foot-note to Ridgway. Audubon Magazine 51(2): 72-80, illus. March-April 1949.

The author compares the list of birds observed by Robert Ridgway in Parley's Park, Summit Co., Utah in 1869 with observations in recent years. Charles W. Lockerbie and the author have in several years' exploration seen 21 species that were not reported by Ridgway, but have failed to find 28 species that Ridgway saw. Changes in vegetation and in other environmental conditions account for some of the differences, but not all of them.

GABRIELSON, IRA N. Bird notes from Nevada. The Condor 51(4): 179-187. July-August 1949.

Records of locality or seasonal occurrence of approximately 140 species that supplement the records in J. M. Linsdale's "Birds of Nevada", published in 1936.

BIRDS (GENERAL)--FAUNAS & MANUALS--Continued

HELLMAYR, CHARLES E. and CONOVER, BOARDMAN. Catalogue of birds of the Americas and the adjacent islands in Field Museum of Natural History. Part I, Number 4. Cathartidae--Accipitridae--Pandionidae--Falconidae. Field Museum of Natural History, Zoological Series 13 (pt. 1, no. 4): 1-358. August 19, 1949.
This volume completes the "Catalogue of Birds of the Americas."

HOUSTON, C. STUART. The birds of the Yorkton District, Saskatchewan. The Canadian Field-Naturalist 63(6): 215-241, illus. November-December 1949.
The area reported upon extends in every direction to about 40 miles from Yorkton. It lies in the aspen-prairie belt and is now largely farmland, except for many lakes and sloughs. The annotated list of 231 species is based on the observations of several active bird students.

KUBLIEN, L. and HOLLISTER, N. The birds of Wisconsin. Revised by A. W. SCHORGER. The Passenger Pigeon 10: 11-24, 59-68, 107-113, 142-148. 1948 and 11: 36-40, 74-79, 114-124. 1949.
Diving birds through birds of prey (original A. O. U. check-list order).

LOWERY, GEORGE H., JR. Additions to the list of the birds of Louisiana. University of Kansas Publications, Museum of Natural History 1(9): 177-192. November 1947.

PALMER, RALPH S. Maine birds. 656 pages, illus. Bulletin of the Museum of Comparative Zoology at Harvard College 102. July 1949. $5.00.
This book is based largely on data gathered by Arthur Herbert Norton from 1894 to 1942. It is intended to be an historical review. The author describes in detail the seaward area, the land area, and the plan of the work (including definitions of terms). The many well known species are described under the following headings: spring, fall, flight years or incursions, breeding or summer, winter, ecology, and remarks. Other species are described in less detail. There is a bibliography of more than 50 pages.

VAN ARSDALL, C. A. A list of the breeding birds of Mercer County, Kentucky. The Kentucky Warbler 25(2): 21-29. May 1949.
The author describes the country and summarizes his observations from 1939 to 1948 on about 80 species.

WOODBURY, ANGUS M. and RUSSELL, HENRY NORRIS, JR. Birds of the Navajo Country. Bulletin of the University of Utah, Biological Series 9(1): 1-160, illus. March 1945.
A detailed account of the birds of southeastern Utah and northeastern Arizona, based largely on field work done during the summers of 1933 to 1938. There is a description of habitats, notes on observations and distribution for each species, and a bibliography of about 50 titles.

BIRDS (GENERAL)--MORPHOLOGY & PHYSIOLOGY

ROMANOFF, ALEXIS W. and ROMANOFF, ANASTASIA J. The avian egg. 918 pages, illus. John Wiley and Sons, New York. 1949. $14.00 (Copied from Science for April 22, 1949, page 414).

A review by Malcolm H. Soule emphasizes the encyclopedic nature of this book. It has a bibliography of more than 2500 titles.

BIRDS (GENERAL)--RESEARCH

BLAKE, EMET R. Preserving birds for study. 38 pages, illus. Fieldiana: Technique, No. 7. July 1949.

BIRDS--WATERFOWL

ALDRICH, JOHN W. and others. Migration of some North American waterfowl: a progress report on an analysis of banding records. 48 pages, illus. U.S.D.I., Fish and Wildlife Service, Special Scientific Report (Wildlife) No. 1. August 1949.

"The information is presented in chapters by species....." [Canada goose and 15 ducks]. "The data are shown chiefly by maps, indicating actual places of banding and recovery, so that they may be of maximum use to investigators who wish to draw their own conclusions concerning the movements of waterfowl." Data from the southward migrations--and particularly those from birds banded and recaptured during the same migration period--are emphasized.

BOVEY, MARTIN. The saga of the waterfowl. 141 pages, illus. The Wildlife Management Institute, Wasington, D. C. 1949. $5.00.

A vivid account of the decline of waterfowl in North America. It is told almost wholly by beautiful photographs, most of them taken by the author.

COMETT, EUGENE V. Wildfowling in the Mississippi flyway. 387 pages, illus. D. Van Nostrand Co., New York. 1949. $12.00.

"This volume is in many ways a guidebook which pictures the past, instructs on the present and points the path to the future." "The crying need today is for more and more accurate knowledge on every angle of the wildfowl problem." Most of the book's chapters are concerned with conditions in each of the provinces and states of the flyway. They were written by 20 different men.

COTTAM, CLARENCE. Limiting factors of present waterfowl knowledge. Transactions of the Fourteenth North American Wildlife Conference. Pages 42-57. 1949.

Pressing needs are: "(1) To coordinate closely and integrate the efforts now being made by the Federal Governments of the United States and Canada and the states and provinces, and the several private agencies vitally interested in this important subject; and (2) to recognize that what the public gets out of this will be roughly in proportion to the support, efforts, and funds for personnel and equipment that are put into this program." More information is needed on breeding and wintering grounds, habitat requirements, life histories, and production.--H. A. Slattery.

BIRDS--WATERFOWL--Continued

DAY, ALBERT M. North American waterfowl. 329 pages, illus. Stackpole and Heck, Inc., Harrisburg. 1949. $4.75.

Since the early days, expanding agriculture has destroyed much waterfowl habitat; and increasing human population has taken greater and greater toll of the birds. The author describes these changes and their culmination in Federal protective laws, refuges, and research; in increasing activities among the States and in Canada and Mexico; and in the work of private organizations. The book is entertaining and informative because it talks in detail of people, places, and birds.

ELDER, WILLIAM H. and ELDER, NINA L. Role of the family in the formation of goose flocks. The Wilson Bulletin 61(3): 133-140, illus. September 1949.

Evidence is presented that a small goose flock is usually a family and that larger flocks are frequently multiples of families rather than mere aggregations of individuals. On this basis it is thought that counts of several hundred small flocks arriving in fall migration might be a good index to the success of that year's hatch. It is shown that Canada geese have a relatively constant reproduction from year to year while blue geese produce few or no young in some years. It was thought probable that a comparison of small flock sizes before and after the hunting season might give a measure of shooting pressure sustained by a particular population. --John W. Aldrich.

ENGELING, GUS A. The mottled duck--a determined nester. Texas Game and Fish 7(8): 6-7,19, illus. July 1949.

Along the Texas coast mottled ducks contend with overgrazing, a concentration of predators, and bad weather.

ERICKSON, RAY CHARLES. Life history and ecology of the canvas-back, Nyroca valisineria (Wilson), in southeastern Oregon. Iowa State College Journal of Science 23(1): 30-32. October 1948.

The author made this study in 1942, 1946, and 1947, mainly on the Malheur National Wildlife Refuge, Harney Co., Oregon. 15,000 or more canvas-backs passed through the Refuge during each of these springs and at least 1.5% remained through each breeding season. In 74 observed canvas-back nests there were about the same number of redhead eggs as canvas-back eggs. However, the hatch of redheads was much below that of canvas-backs. "Cropping, haying, grazing, water level manipulation, and muskrat management were useful tools in improving habitat for waterfowl utilization. Stabilized water levels during the nesting season were vital to suitable nesting habitat and increased nesting success....."

GRISCOM, LUDLOW. An ornithologist looks at the Atlantic flyway. Transactions of the Fourteenth North American Wildlife Conference. Pages 75-86. 1949.

Conditions are very complex. To maintain the supply of waterfowl is a difficult and expensive feat--it involves the cooperation of man and the preservation of marshland.

BIRDS--WATERFOWL--Continued

HANSON, HAROLD C.; ROGERS, MURRAY; and ROGERS, EDWARD S. Waterfowl of the forested portions of the Canadian Pre-Cambrian shield and the palaeozoic basin. The Canadian Field-Naturalist 63(5): 183-204, illus. September-October 1949.

The authors investigated the area around, and inland from, the south end of James Bay in 1946, 1947, and 1948. The only commonly breeding waterfowl away from the coast were black ducks, American golden-eyes, hooded mergansers, American mergansers, and Canada geese.

HERVEY, RALPH J. Studies on the toxicity of algae for animals. Proceedings of the Utah Academy of Sciences, Arts and Letters 24: 49-50. 1947. $3.00 a volume.

Investigations at the Bear River Migratory Bird Refuge in northern Utah have indicated that there may be a relationship between duck sickness and algae: (1) the algae may serve as a source of media for growth of Clostridium botulinum, the causative agent of botulism; (2) certain algae may be toxic in themselves. 28 species of algae were tested for toxicity. Blue-green algae and dinoflagellates, as groups, appeared to be most toxic.--M. A. Slattery.

HOPKINS, R. C. The fate of mallards banded at Horicon. Wisconsin Conservation Bulletin 14(10): 10-12, illus. October 1949.

"Of the ducks reported shot, more than half were taken in Wisconsin....."

HORN, EVERETT E. Waterfowl damage to agricultural crops and its control. Transactions of the Fourteenth North American Wildlife Conference. Pages 577-586. 1949.

In the Pacific Coast states much natural waterfowl habitat has been destroyed by drainage and cultivation and as a result they have turned to farm crops for food. In California, widgeon feed on vegetable crops, alfalfa, pasture grasses, and fall-planted barley; pintails and mallards on rice, barley, and other grains; and geese on growing grain and pasture lands. Special hunting seasons and herding waterfowl away from crops relieves the situation a little. ".....establishment of management areas planted to an adequate crop of high preference, and flooded at a time damage is occurring to commercial crops, has afforded satisfactory protection to crops, when the growers practiced systematic herding or frightening of the birds from the croplands."--M. A. Slattery.

JEWETT, STANLEY G. The nesting population of the Canada goose in the Pacific Northwest. Transactions of the Fourteenth North American Wildlife Conference. Pages 87-94, illus. 1949.

There are estimated to be approximately 8600 pairs of nesting geese in California, Oregon, and Washington at the present time.--M. A. Slattery.

BIRDS--WATERFOWL--Continued

KINGHORN, ROBERT G. Determination of winter waterfowl population trends in Colorado by aerial survey. Transactions of the Fourteenth North American Wildlife Conference. Pages 68-74, illus. 1949.

The visibility and slow-flight characteristics of either the 120 or the 140 model of the Cessna side-by-side airplane make it useful for duck counts. 15 flying hours per month is required to cover the winter waterfowl concentration areas in Colorado. The same pilot and observer are used to minimize human error. The flights are made at the same time of month over a predetermined route. A K-20 aerial camera is used to check the accuracy of the counts. The survey does not give the total waterfowl population; but it gives the monthly trend, and it indicates periods of peak concentration, time of migrations, and the apparent effect of hunting pressure on the Canada goose.--M. A. Slattery.

McHAFFEY, JUANITA. Tishomingo National Wildlife Refuge. Oklahoma Game and Fish News 5(2): 3-6, illus. February 1949.

This 13,450-acre waterfowl refuge is on the reservoir impounded by Denison Dam on Red River. More than 60,000 ducks have used the refuge at one time. Cultivated crops provide a large part of the food. One of the handicaps to the refuge is the great fluctuation in levels of the reservoir.

MENDALL, HOWARD L. Breeding ground improvements for waterfowl in Maine. Transactions of the Fourteenth North American Wildlife Conference. Pages 58-64. 1949.

The Maine Cooperative Wildlife Research Unit has carried on waterfowl life history and management studies since 1938, principally on the black duck and the ring-necked duck. The duck population is sparse and there is low productivity. Adverse water conditions account for most of the trouble. Extremes in water levels destroy nests directly and favor destruction of nests by predators. Marshes on the Moosehorn National Wildlife Refuge in eastern Maine were improved for ducks by stabilizing the water level and planting food.--M. A. Slattery.

MUNRO, J. A. Studies of waterfowl in British Columbia. Baldpate. Canadian Journal of Research D, 27(5): 289-307, illus. October 1949.

A large population winters along the coast and a small one in the interior. Nesting is all in the interior and is especially heavy in the Cariboo Parklands and the Lakes District near Vanderhoof. Under certain conditions baldpates destroy cultivated forage plants, but their value to sport and as food more than compensates for this loss.

MUNRO, J. A. Studies of waterfowl in British Columbia. Green-winged teal. Canadian Journal of Research D, 27(3): 149-178, illus. June 1949.

A small nesting population of green-winged teal is widely distributed in the interior; a rather large number winter on the coastal plain; and many stop in spring and fall. The species has no habits that are detrimental to human interests.

BIRDS--WATERFOWL--Continued

LUSGROVE, JACK W. and LUSGROVE, MARY R. Waterfowl in Iowa. Second edition. 132 pages, illus. State Conservation Commission, Des Moines, Iowa. 1947. $1.00.

In this edition the authors have added chapters on "Banded Waterfowl" and "The Goose Flight of Western Iowa." See page 43 of Wildlife Review No. 38 for an abstract of the first edition of this useful, attractive book.

NORMAN, MICHAEL. The good old days of waterfowling. Outdoor Life 103(4). 36-39, 83-85, illus. April 1949.

A history of waterfowl gunning methods from colonial days to 1935. "Sink boxes, live decoys, bushwhack rigs, dogs tolling on the beach--maybe we'd still be gunning for ducks and geese with some of these colorful aids, if market hunters hadn't gone and spoiled it all."

SHEPPARD, R. W. The American brant on the lower Great Lakes. The Canadian Field-Naturalist 63(3): 99-100. May-June 1949.

".....brant occurrences on the Lower Great Lakes during the past ten to fifteen years have been very much more numerous than in all of the preceding sixty-five or seventy years covered in this account." In the spring of 1946 a flock of about 30 destroyed 8 acres of a total 13 acres of carrots on the south shore of Lake Ontario.

SHORTT, A. H. and CARTWRIGHT, B. W. Know your ducks and geese. Sports Afield Publishing Co., Minneapolis. 1948. $5.00. (copied from The Wilson Bulletin for September 1949, page 192).

A review by David E. Davis says, in part: "This book, a superb example of a combination of art and science, presents excellent portraits of 36 ducks and geese with concise, modern descriptions. For each species there is a 10 x 12 inch colored plate of 1 or more individuals in flight and, printed on glassine paper, there is a small black and white sketch of male and female on the water, a map of the wintering and breeding distribution and a discussion of distribution, migration, food, weights, courtship, and nesting as well as references and a description of various plumages."

SOLLS, LYLE K. A preliminary report on renesting in waterfowl. Transactions of the Fourteenth North American Wildlife Conference. Pages 260-275, illus. 1949.

In 1947 and 1948 the author made a study of duck renesting at Delta, Manitoba. "Hens were captured on the nests, banded, feather-marked, their nests robbed, and hens released. After this operation the area was watched for renesting ducks." Of 66 marked hens, 13 renested on the study area. It is likely that many more renested. Renests could not safely be told from first nests.—H. A. Slattery.

STOLLBERG, BRUCE P. Competition of American coots and shoal-water ducks for food. The Journal of Wildlife Management 13(4): 423-424. October 1949.

A comparison of the contents of 32 coot stomachs and the contents of 31 shoal-water duck stomachs collected during the same period from the same Wisconsin locality (Horicon) showed no important competition. 90% of the volume of coot food was duckweeds.

BIRDS--WATERFOWL--Continued

VAN DEN AKKER, JOHN B. and WILSON, VANEZ T. Twenty years of bird banding at Bear River Migratory Bird Refuge, Utah. The Journal of Wildlife Management 13(4): 359-376, illus. October 1949.

About 35,000 individuals of 40 species of water birds were banded between 1929 and 1948. There have been returns on nearly 3,000. Except for Canada geese and redheads, the majority of the birds had been afflicted with, and apparently recovered from, botulism. Percentages of returns indicated good actual recovery. Most of the returns were from states and countries in the Central and Pacific Flyways.

YOCOM, CHARLES F. A study of sex ratios of mallards in the state of Washington. The Condor 51(5): 222-227, illus. September-October 1949.

Sex ratios were obtained on 8805 mallards in 3 arbitrarily divided sections of Washington. They averaged 138 males to 100 females west of the Cascades; 134 males to 100 females in the central section; and 146 males to 100 females in the eastern section. Ratios in the fall of 1947 from hunters' reports from eastern Washington (176 males to 100 females) do not coincide with data obtained during the same period by counting sexes in the field (118:100), and indicate a certain amount of selective shooting by hunters.—John W. Aldrich.

BIRDS--FISH-EATERS

GALLET, ETIENNE. Die Flamingos der Camargue. 127 pages, illus. Verner Krebser und Co., Thun, Switzerland. (Copied from Nature for July 9, 1949, page 45).

A review by Seton Gordon says that "This book is remarkable for the excellence and variety of its photographs, and for the artistry and vividness of the writing." It describes this Rhone delta country and the life and behavior of its flamingoes.

KING, FRANK H. The American egret in Wisconsin. The Passenger Pigeon 11(1): 3-17, illus. January 1949.

A detailed study of range, abundance, migration, and nesting; with notes on occurrence in neighboring states.

YORK, G. T. Grasshopper population reduced by gulls. Journal of Economic Entomology 42(5): 837-838. October 1949.

California gulls occurring in flocks varying from one to five thousand near Cut Bank, Montana and feeding extensively upon Melanoplus bivittatus reduced the population of this destructive grasshopper 80% in 5 days. The field where this activity occurred consisted of alternate strips of barley and fallow ground and was situated near a temporary pond. The gulls fed chiefly upon the slow-moving and larger females, and restricted their feeding to the fallow areas where the population was reduced from 5 grasshoppers per square yard to 1 per square yard. This same feeding effected a reduction from 25 to 5 per square yard in the rows of grain.--R. T. Mitchell.

BIRDS--CRANES & RAILS

KOZICKY, EDWARD L. and SCHMIDT, FRANCIS V. Nesting habits of the clapper rail in New Jersey. The Auk 66(4): 355-364. October 1949.

The clapper rail is a common breeding bird in the salt marshes of New Jersey. It is mostly migratory, but there are several midwinter records. In 1948, the authors found 56 nests containing eggs on 6 sites totaling 430 acres in Cape May County. The mean number of eggs per nest was about 10, with a range of 4 to 14. The height of the hatching period was between June 16 and 21. The greatest cause of nesting loss is thought to be high tides in conjunction with northeast storms. The majority of the nests were in saltmarsh grass type more than 2 feet tall. "It became apparent during the course of the investigation that an annual nest count had possibilities of furnishing an index to population trends. The nests were easily located, and two men could cover a census area of 75 to 100 acres in a day."--John W. Aldrich.

WALKINSHAW, LAWRENCE H. Exploring Chippewa County, Michigan sandhill crane marshes. The Jack-pine Warbler 25(4): 130-139, illus. October 1947.

Experiences between 1940 and 1943, including observations on vegetation and associated birds.

BIRDS--UPLAND GAME (GENERAL)

LIGON, J. STOKLEY. Upland game bird development project. New Mexico 27(5): 26-27, illus. May 1949.

The value of this project, near Dexter, depends on planned intensive development of habitat. Fencing of a 51-acre tract was begun in May 1948. This was followed by the fencing of 4 acres within it and by other construction. Perennials for food and cover are being planted this year. 400 pheasants were placed in the 4-acre enclosure in July and August 1948. In August, 50 Gambel quail and 50 bobwhites were placed in a retaining pen outside the 51-acre tract.

BIRDS--UPLAND GAME (BOBWHITE & CALIFORNIA QUAIL)

BERG, W. J. and WARREN, LLOYD O. The bobwhite quail in Arkansas. 46 pages, illus. Arkansas Agricultural Experiment Station Bulletin 488. June 1949.

This bulletin discusses life history, habits, and ecology; habitat studies in northwest Arkansas, begun in 1937; and topographic and farming conditions relative to quail. Bobwhites are common throughout the State and could be made to thrive in every county. Stock ponds are very attractive to quail when they are provided with brush for cover and lespedeza for food. Fruit-bearing shrubs in fencerows and lespedeza or corn fields will keep quail on the farm. Important factors in the decline of quail are overgrazing, farming large fields, elimination of brushy borders, burning fields and field borders, too many hunters, and stray cats, hounds and foxes. "Land areas taken out of cultivation soon grow up in unsatisfactory cover; fail to provide adequate food; and are then practically deserted by quail."

BIRDS (GENERAL)--(BOBWHITE & CALIFORNIA QUAIL)--Continued

BRENT, HOLER I. The bobwhite quail; its population density in relation to food and vegetative cover; also its management; in Warren County, Iowa. Master's thesis, Louisiana State University, 1948 (copied from an anonymous abstract in Journal of Forestry for April 1949, page 295).

".....the most practical quail management is accomplished through good land use." This study describes practices being adapted by farmers in Warren County.

DAVISON, VERNE E. Bobwhites on the rise. 150 pages, illus. Charles Scribner's Sons, New York. 1949. $3.75.

The author tells landowners how to produce this most popular of game birds. Food and cover are bobwhites' greatest needs. Their production involves management of wildlife land, woodland, cropland, pastures, and idle land. The work of individual landowners can be supplemented by that of soil conservation districts, state game departments, and clubs. Overshooting must be avoided. "Adequate food and cover must be grown at each location on a farm where a covey is wanted. One good winter food, plus grass and shrubby cover, will support the birds."

GOODRUM, PHIL. Status of bobwhite quail in the United States. Transactions of the Fourteenth North American Wildlife Conference. Pages 359-369. 1949.

Results from questionnaires sent out to 39 states showed a decrease in bobwhites during the period 1939-1948. Increased gun pressure is the cause of some of the decline; but nearly all of the major quail hunting states attribute the reduction to changes in land use, such as clean farming, more livestock, and exclusion of fire. Habitat improvement seems to be the only practical method of increasing the population.--M. A. Slattery.

HERMAN, CARLTON M. and BISCHOFF, ARTHUR I. The duration of Haemoproteus infection in California quail. California Fish and Game 35(4): 293-299, illus. October 1949.

Once infected with Haemoproteus lophortyx, 16 California quail remained infected throughout their lives (up to 4 years 8 months).

DALBACH, CHARLES A. and LEEDY, DANIEL L. Prevention of crop damage by pheasants. Transactions of the Fourteenth North American Wildlife Conference. Pages 592-603. March 1949.

Results of a questionnaire showed that pheasant damage to corn was considered a problem in but 7 of 19 states reporting. Recommendations for preventing damage have been made to farmers by several states. They include (1) removal of good fence row cover when pheasant-acceptable crops are planted near it, (2) written permission to kill offending birds, (3) liberalizing of hunting restrictions, (4) repellents, and (5) the use of a corn trail. More research on pheasant habits and on repellents are needed.--M. A. Slattery.

BIRDS--UPLAND GAME (BOBWHITE & CALIFORNIA QUAIL)--Continued

MARSH, AL. Quail-fox relationship. The Tennessee Conservationist 14(3): 10-12, May-June 1949.
A 3-year study on 4 areas in west Tennessee indicated very slight predation on quail by foxes. Consumption by foxes of insects, rodents, and snakes may even benefit man and quail.

NESTLER, RALPH B. Nutrition of bobwhite quail. The Journal of Wildlife Management 13(4): 342-358. October 1949.
This is a summary and evaluation of 10 years' Federal research, done mostly at the Patuxent Research Refuge, Laurel, Md. Dietary requirements were determined for breeding quail, growing quail, and non-productive mature birds in winter ("yellow corn was the leading cereal for maintenance.").

NESTLER, R. B.; DeWITT, J. B.; and DERBY, J. V., JR. Vitamin A storage in wild quail and its possible significance. The Journal of Wildlife Management 13(3): 265-271. July 1949.
Livers of 445 wild bobwhites taken in Iowa, Wisconsin, and Illinois in late fall and winter of 1947-48 were assayed for vitamin A. All contained vitamin A; but the amount in many was so low that it is estimated that 4% of the birds would have died directly from lack of vitamin A within 3 weeks or that as much as 42% might have been affected enough to make them die from predation and severe weather.

BIRDS--UPLAND GAME (PHEASANT)

BISHOP, JAMES S. Seed-stock investigation: eastern half of the Town of Wallingford, October 1941 through December 1945. 34 pages, illus. Connecticut State Board of Fisheries & Game, Pittman-Robertson Bulletin No. 2, 1949.
An average of 1 pheasant was bagged for every 10 hunting attempts. Breeding stock suffered on a few peak days of hunting. 175 of the 576 birds bagged were wild-raised. Their take approximated the annual production. Cocks were released each hunting season, and from 29% to 58% were taken on the area by hunters. Abundance of food and cover did not insure over-wintering. A recommended plan of management ".....would be to select and develop the wintering coverts on the area, close them to all hunting, and surround them with closed areas large enough to protect the birds from the effects of hunting." "Over most of Connecticut, during the hunting season, pheasants cannot remain in the territory that is suitable for them. Many more birds are driven out and kept out by the numerous hunters and dogs than are actually killed."

BIRDS--UPLAND GAME (PHEASANT)--Continued

FERREL, CAROL M.; HARTER, HAROLD; and HIEHLE, JACK. A progress report on pheasant hunting season studies for the years 1946, 1947 and 1948. California Fish and Game 35(4): 301-322, illus. October 1949.

In 1946, 2 areas of several thousand acres each were set aside in the northern Sacramento Valley for the study of the effect of heavy hunting pressure on established pheasant populations. Each year most of the hunting pressure was during the first 3 days of the 10-day season. Most of the kill was birds of the year. Pen-raised birds were released on 1 area in 1947 and 1948. Returns from these compared with the kill of wild birds indicate that "Apparently pheasants are able to withstand heavy hunting pressure in the better habitat of the Sacramento Valley without benefit of stocking with pen-raised birds. The management procedure most urgently needed is a working agreement with landowners so that hunter access to the present populations of wild pheasants will be permitted on property currently posted against hunting trespass."

KOZLIK, FRANK and KABAT, CYRIL. Why do pheasant populations remain low? Wisconsin Conservation Bulletin 14(10): 7-10, illus. October 1949.

Apparently because of a big illegal kill of hens.

LEEDY, DANIEL L. Ohio pheasant nesting surveys based on farmer interviews. The Journal of Wildlife Management 13(3): 274-286, illus. July 1949.

Data are based on personal interviews with approximately 7% of the farm operators in each township in Henry and Wood Counties, Ohio. There was a decrease in pheasant numbers in all but one township from the 1937-40 period to the 1946-47 period. Pheasant nests were most abundant in first cutting alfalfa, followed by red clover, mixed hay, second cutting alfalfa (1/6 as many nests as first cutting alfalfa), sweet clover, wheat, and oats; but only 1/5 of the nests in first cutting alfalfa had hatched at the time of harvesting. Casualities per nest in wheat were less than 15% of those in first cutting alfalfa.

MacNAMARA, L. G. and KOZICKY, E. L. Band returns from male ring-necked pheasants in New Jersey. The Journal of Wildlife Management 13(3): 286-294, illus. July 1949.

There was an 8% return of bands from 14,050 pheasants liberated on open lands in the summer of 1946. The type of habitat appears to be the most important factor in the success of the liberation. Young birds acclimated themselves to a wild habitat more readily than adults. Source of birds also affected survival. 50% of 315 birds liberated for 10 or more days were shot within a mile of their release point; 98% were shot within 10 miles.

McCLURE, H. ELLIOTT. The eyeworm, Oxyspirura petrowi, in Nebraska pheasants. The Journal of Wildlife Management 13(3): 304-307, illus. July 1949.

This nematode was first noted in Nebraska in 1941. "A study of highway killed and other accidental victims throughout north-central Nebraska showed a gross parasitism of 40 per cent." Infection was greatest in the fall in the sandhills.

BIRDS--UPLAND GAME (PHEASANT)--Continued

MILLER, WILFORD L. They're dead before you fire a shot! Outdoorsman 91(5): 3-5, illus. September-October 1949.
In North Dakota several years' study indicates that half of all pheasant eggs laid will never hatch and that half of all young birds will be dead before fall. Farm practices account for most of the egg loss, weather accounts for most of the loss of young birds. Better cover is the answer to much of these losses, as well as the winter loss of adults. Only locally is predation an important factor.

NELSON, BERNARD A. and JANSON, REVEL G. Starvation of pheasants in South Dakota. The Journal of Wildlife Management 13(3): 308-309, illus. July 1949.
In the winter of 1947-48 unusually heavy snows in north-central South Dakota resulted in some starvation. In 2 flocks of about 2000 and 1500 birds the mortality was 5%. The authors describe the behavior of starving birds and the condition of dead birds. No disease was found.

ROSEN, MERTON N. and PLATT, EUGENE D. The control of avian tuberculosis in a state game farm. California Fish and Game 35(4): 323-327. October 1949.
Tuberculosis decreases egg production and causes high mortality in game birds. At the Yountville Game Farm the disease occurred only in pheasants kept for a second and third laying season. It was eliminated when pheasants were liberated at the end of their first breeding season.

FABER, RICHARD D. Observations on the breeding behavior of the ring-necked pheasant. The Condor 51(4): 153-175, illus. July-August 1949.
In 1947 in Dane Co., Wisconsin, courtship behavior began in February with clucking and display. It became more frequent through the first half of April, and then decreased. Meanwhile, the area covered by a series of courtship displays changed from a linear to a circular form. Mating began in mid-April and continued through May and June. Antagonism between cocks began in February and developed into defending territory the first of April. A residue of non-territorial cocks remained throughout the season. Antagonistic behavior between hens occurred chiefly in April and May. —John W. Aldrich.

WANDELL, WILLET N. Status of ring-necked pheasants in the United States. Transactions of the Fourteenth North American Wildlife Conference. Pages 370-390, illus. 1949.
The western half of the country is the only section at present that reports a fully recovered population. The Northeast indicates no recovery. Partial recovery is reported from scattered sections extending from east to west. Suggested causes of the decline are adverse weather conditions, adverse agricultural practices, illegal hen kill, overshooting, predation, and rhythmic variations.—M. A. Slattery.

BIRDS--UPLAND GAME (PHEASANT)--Continued

WILSON, JOHN E. A history of the ringnecked pheasant in Michigan. Master's thesis, University of Michigan, 1948 (copied from an anonymous abstract in Journal of Forestry for March 1949, page 218).

"As land values in southern Michigan seemingly do not warrant management for pheasants alone, we must be satisfied with the greatest possible return under the best type of integral land use in this region."

BIRDS--UPLAND GAME (GROUSE, ETC.)

GRANGE, WALLACE B. Wisconsin grouse problems. 318 pages, illus. Wisconsin Conservation Department, Madison 2, 1948.

This is a report on a Pittman-Robertson project that continued from 1940 to 1942. It deals with the interrelations and the relations to their environment of ruffed grouse, prairie chicken, sharp-tailed grouse, and spruce grouse. The author reviews previous work in Wisconsin; describes a booming-hooting survey; analyzes the grouse kill and the kill of other game on a selected area in central Wisconsin; and discusses the grouse cycle, predation, migration, food habits, performances, habitat requirements, and grouse management. There are many useful photos, maps, and charts. If present trends in land use continue, prairie chickens face extinction, sharp-tails are certain to become rare, and spruce grouse may increase. "The ruffed grouse is apparently secure in Wisconsin indefinitely and will continue to be plentiful and huntable for many decades."

HAMERSTROM, F. N. JR., and HAMERSTROM, FRANCES. Daily and seasonal movements of Wisconsin prairie chickens. The Auk 66(4): 313-337, illus. October 1949.

Banding in central Wisconsin since 1935 showed that most prairie chickens stayed in the same area, sometimes no more than 2 or 3 miles in diameter, year after year, with only very local movements to the breeding grounds in the spring and to the wintering grounds in the fall. Some exchange occurred among winter flocks and between breeding grounds. Some individuals moved much farther--up to 100 miles. The longer movements are probably associated with loss of winter food supply or lack of suitable habitat. This ability to make long journeys in search of suitable habitat is thought to be the reason for the rapid spread of prairie chickens northward during the lumbering-off period. Now their habitat has largely been destroyed. --John W. Aldrich.

PATTERSON, ROBERT L. Sage grouse along the Oregon trail. Wyoming Wild Life 13(8): 4-15, 34-37, illus. September 1949.

A 3-year study was begun in the Upper Green River Valley in northern Sweetwater Co., Wyoming in the spring of 1948. Only a few males wintered in the area; but in the spring of 1949 more than 3000 were found on 47 strutting grounds in the 250-square-mile area. Nests averaged 53 to the square mile. About one-third of all nests hatched successfully. Most of the destruction was by ground squirrels and badgers. Bad weather caused a 50% mortality in broods. The population of the entire area was estimated to be 12,800 females and 3230 males.

BIRDS--UPLAND GAME (GROUSE, ETC.)--Continued

LESTERSKOV, KAJ. The recent decline of the Hungarian partridge. The Ohio Conservation Bulletin 13(3): 20-21, illus. March 1949.

"All facts seem to point towards a general decline in the partridges in the Great Lakes region." Some contributing factors are rather unfavorable climate, large farms with few fencerows, high nest mortality caused by hay mowing, and poorly regulated harvest. Competition with pheasants and lack of adaption of the original stock to our conditions may also be limiting factors.

WILSON, HERRICK L. The effect of topography and land use on ruffed grouse in southern Michigan. 96 pages, illus. Master's thesis, The University of Michigan, School of Forestry and Conservation, Ann Arbor, 1948. (copied from an anonymous abstract in Journal of Forestry for July 1949, page 548).

A 1-year study was made of 2 areas. There was a grouse population of 1 bird to 8-9 acres. Effects of topography, cover types, and silvicultural practices were studied.--N. W. Hosley.

BIRDS--UPLAND GAME (WILD TURKEY)

CLARKE, C. H. D. The wild turkey in Ontario. Sylva 4(6): 5-12,24, illus. 1948.

Wild turkeys once lived in 15 Ontario counties. Their last stand was in Essex County at about the beginning of the present century. This is now one of the most settled parts of the Province. ".....our wild turkeys were part and parcel of our southern hardwood forests." "The curtain came down simultaneously on turkey and forest."

DAVIS, HENRY E. The American wild turkey. 319 pages, illus. Small-Arms Technical Publishing Co., Georgetown, S. C. 1949. $5.00 (copied from The Wilson Bulletin for September 1949, page 192).

A review by David E. Davis says, in part: "For hunters of our finest game bird, this book provides an interesting merger of personal adventures and opinions with the scientific data culled from the excellent research of Mosby and Handley. Much of the book deals with methods of hunting. Concerning conservation of the turkeys the author emphasizes stocking and control of predators with a bare mention of environmental improvement....."

GLOVER, FRED A. and BAILEY, R. WAYNE. Wild turkey foods in West Virginia. The Journal of Wildlife Management 13(3): 255-265, illus. July 1949.

The authors analyzed 4300 droppings, taken mostly in the winter of 1946-47. More than 4000 were from beech-birch-maple-hemlock forest, the others were from oak-hickory-pine. More than 98% of the material was plants. Emergency feed of oats and corn was most abundant. The commonest wild foods, in descending order of importance were grasses, beechnuts, beech buds, ferns, hemlock leaves, bryophytes, wild grape, dogwood, blackberry, and wild cherry. Beechnuts and the fleshy fruits were preferred. "Recommended practices to increase the natural foods are stream and spring improvement, freeing suppressed food plants, making more openings, and brushing out trails."

BIRDS--UPLAND GAME (WILD TURKEY)--Continued

MOSBY, HENRY S. The present status and the future outlook of the eastern and Florida wild turkeys. Transaction of the Fourteenth North American Wildlife Conference. Pages 346-358, illus. 1949.

Originally, eastern and Florida wild turkeys occurred in 36 states; but by 1948 they had disappeared from 19 of them. They now occupy about 12% of their ancestral range. They are increasing in 3 states, remaining static in 2 states, either static or increasing in 1 state, static or decreasing in 3 states, and decreasing in 3 states. They are near extirpation in 5 states. Restocking has been attempted in most states but generally has been unsuccessful. The future of these races depends largely upon the degree of management practiced on public lands.--H. A. Slattery.

WALKER, EUGENE A. The status of the wild turkey west of the Mississippi River. Transaction of the Fourteenth North American Wildlife Conference. Pages 336-345, illus. 1949.

The former range of Rio Grande and Merriam's turkeys included all or portions of 12 western states. Their present range is restricted to 8 states; and their position as game is precarious. Restoration has been successful to some extent in Colorado, Arizona, Oklahoma, South Dakota, Texas, and New Mexico. Decreased numbers are due to: "(a) unwise land use, (b) unfavorable weather, (c) predation, (d) poaching, and (e) scarcity of suitable habitat." --H. A. Slattery.

BIRDS--UPLAND GAME (PIGEONS)

McMILLAN, IAN I. The concentration of band-tailed pigeons in central California in 1949. The Condor 51(5): 234-240, illus. September-October 1949.

A great concentration occurred between January and March in different areas within 150 miles of Paso Robles, San Luis Obispo County. The birds fed on waste grain, but many permits to kill them were issued because of alleged damage to sprouting grain. At least 100,000 pigeons are believed to have been killed. There is need for cooperation between the local agricultural, game, and other agencies that are aware of the facts in such instances as this and the people in charge of wildlife conservation.

MEARS, JOE. The bandtails were like bees. Outdoor Life 103(6): 38-40, 88-89, illus. June 1949.

Early this year (after the close of the hunting season) 600,000 or more bandtail pigeons descended on newly planted grainfields in the upper Salinas Valley, California; and in a few days devastated 150,000 acres of barley, oats, and wheat. A limited number of permits were issued and about 15,000 birds were shot. It might be better to let each state set its dates for shooting migratory birds.

NEFF, JOHNSON A. and CULBRETH, JACK C. Status of the band-tailed pigeon in Colorado, season of 1946. 24 pages, illus. Colorado Department of Game & Fish. April 1947.

See Wildlife Review No. 56, page 24, for report on 1947 status by Robert G. Kinghorn and Johnson A. Neff.

BIRDS--UPLAND GAME (PIGEONS)--Continued

PACKER, HERBERT H. Pigeon control. Pests and their control 16(1): 10-11. January 1948.
The author describes recent control by trapping in Philadelphia. He believes that the most effective way of ridding a community of pigeons is by preventing their being fed on public property.

BIRDS--HAWKS & OWLS

BEIDLEMAN, RICHARD G. Guide to the birds of prey of Colorado. 24 pages, illus. University of Colorado Museum, Leaflet No. 6. August 1949. 25¢ plus postage.
This useful leaflet comprises keys, drawings, and descriptions of 20 species of hawks, eagles, and kites and 12 species of owls.

DENNIS, JOHN V. A good word for hawks and owls. Outdoor Life 103(3): 24-25, 101, illus. March 1949.
"These rat and mouse killers are among our most useful birds, but we are exterminating them because of the misdeeds of a few species. This writer maintains they should all be put on the protected list."

McDOWELL, ROBERT D. and LUTTRINGER, LEO A., JR. Pennsylvania birds of prey. 33 pages, illus. Pennsylvania Game Commission, Harrisburg. November 1948. 25¢.
The object of this pamphlet ".....is to show people how to identify them [birds of prey] and to understand in a general way the part they play in the scheme of nature." ".....our only problem is to control those which are especially destructive to game and song birds, and give protection to the rest." Keys, color plates, black and white drawings of hawks at rest and in flight, black and white drawings and photos of owls, and descriptions aid in identification. Charts show the principal foods of each species.

BIRDS--SONGBIRDS
(See also ANIMALS--FURBEARERS (GENERAL), Neubrech)

GEORGE, JOHN L. and MITCHELL, ROBERT T. The effects of feeding DDT-treated insects to nestling birds. Journal of Economic Entomology 40(6): 782-789. December 1947.
"The application of 1 pound of DDT per acre to spruce-balsam forests in the Adirondacks in the experimental control of the spruce budworm was not sufficient to exterminate the insects in the sprayed area, and nestling diet therefore consisted of both sprayed and unsprayed insects. The field tests simulated these conditions." "When nestlings were fed in the laboratory with sprayed material exclusively and suffered a loss in vigor from a starvation diet they were definitely susceptible to DDT toxicity." Nestlings would probably be affected in the same way in a large forested area in which the entire insect population was killed by DDT.

BIRDS--SONGBIRDS--Continued

MOTE, C. E. The effect of DDT on birds and the relation of birds to the spruce budworm, Archips fumiferana Clem. In Forest spraying and some effects of DDT. Ontario Department of Lands and Forests, Division of Research, Biological Bulletin No. 2, pages 57-62. 1949.

DDT sprayed on nests in Algonquin Park in 1944 did not affect egg hatching, young, or adults. "All birds taken in the infected spruce-balsam association were feeding on one or more stages of the spruce budworm." ".....species from other habitats came into the infected areas to feed on the spruce budworm."

KNOWLTON, G. F. and NYE, W. P. Insect food of the vesper sparrow. Journal of Economic Entomology 41(5): 821. October 1948.

The authors summarize data from 116 stomachs of western vesper sparrows taken throughout Utah between 1934 and 1945. Most of the insects recognized were injurious. Those found in rather large numbers were grasshoppers, false chinch bugs, leafhoppers, leaf beetles, alfalfa weevils, lepidoptera larvae, and ants. Additional food consisted of more than 3000 seeds and numerous seed and plant fragments.

NEFF, JOHNSON A. Blackbird depredations on Arkansas rice fields. Transactions of the Fourteenth North American Wildlife Conference. Pages 556-566. 1949.

In 1948 the author made a preliminary survey of damage by redwings, bronzed grackles, and cowbirds. Several years of study will be given to every phase of this problem: actual amount of damage, biology of the birds, methods of rice culture, ways of frightening the birds, reduction of populations.

NEFF, JOHNSON A. Migratory blackbirds and crop damage. 17 pages, illus. Fish and Wildlife Service, U. S. Department of the Interior, and Extension Service, University of Arkansas College of Agriculture. 1949?

This is a summary of information on blackbird migrations from and to Arkansas. It is based on banding data. Most of the banding in Arkansas has been done in winter and early spring. "Only in the case of the bronzed grackle and the cowbird have enough been banded in Arkansas to give an adequate picture of the spread of these birds to the nesting grounds."

ODUM, EUGENE P. and NORRIS, ROBERT A. Effect of DDT on birds in Georgia pecan orchards with a note on late summer census methods. The Journal of Wildlife Management 13(4): 415-417. October 1949.

"July and August observations on 10 pecan orchards in Georgia, seven of them sprayed once or twice with DDT, failed to yield any evidence of bird mortality. The spray schedule in these orchards involved DDT in amounts of 2 to 6.5 lbs. per acre." At that season the population was low, the feeding range of many birds extended beyond the groves, and only a few birds were still nesting.

BIRDS--SONGBIRDS--Continued

PUTNAM, LOREN S. The life history of the cedar waxwing. The Wilson Bulletin 61(3): 141-182, illus. September 1949.

This study was made at Put-in-Bay, northwestern Ohio, in 1939 and 5 additional summers. In this area there is an erratic winter population and a nesting population that arrives late in May. Summer movements are related to seasonal fruits. Mating and nesting occur in small territories. Young are fed insects for the first 3 days, then fruit. Waxwings are gregarious--even during the breeding season, when they are feeding. Of 60 nests that contained eggs, three-fourths fledged 1 or more young.

REPTILES & AMPHIBIANS

ALLARD, H . A. The eastern box-turtle and its behavior. Journal of the Tennessee Academy of Science 23(4): 307-321, illus. and 24(2): 146-152. October 1948 and April 1949.

The writer reports on observations in Virginia and elsewhere that extended through more than 20 years. He describes habitat, aquatic tendencies, aestivation and hibernation, food, egg laying and incubation, young, age, mating, senses, adaptive behaviors, and enemies.

DUSI, JULIAN L. The natural occurrence of "redleg," Pseudomonas hydrophila, in a population of American toads, Bufo americanus. The Ohio Journal of Science 49(2): 70-71. March 1949.

Heavy mortality in a pond near Charleston, West Virginia in March 1948 was due to this bacillus.

FITCH, HENRY S. Outline for ecological life history studies of reptiles. Ecology 30(4): 520-532. October 1949.

The author discusses "Equipment and Methods", "Sample Studies", "Special Studies and Techniques", and "Suggested Outline for Studies." The last is subdivided in great detail under the headings "The egg and embryo", "The young", and "The adult." There is a list of approximately 125 references, with a species index.

FLATTERY, K. An effective way to control snakes. Pests and their control 17(2): 16-18, illus. February 1949.

In August 1948 the town of Inwood, Manitoba was invaded by thousands of garter snakes, said to be chiefly Thamnophis sauritus proximus. Snakes swarmed through the streets and into buildings. Hundreds were killed without visible effect on the population. Searching for a control method, the author made laboratory tests of chlorine, coal gas, cyanogas, DDT, rotenone, antu, arsenic, and chlordane. None was found suitable for field use. Later poisoned with nicotine sulphate was more effective. "Ten metal trays, each measuring 17½" x 11½" x 3/4" deep [capacity of each about 2.4 litres], were set out near the snake pits. The trays were then covered with wire mesh, securely fastened by stakes driven into the ground. They were then filled with water to which one ounce of nicotine sulphate was added." [In answer to an inquiry, Mr. Flattery states that about 10 milliliters of Black Leaf 40 was used per tray]. Two days after the trays were exposed the areas

REPTILES & AMPHIBIANS--Continued

around them were littered with hundreds of dead snakes. For the first time in several weeks no snakes were seen in the village. As to the cause of the outbreak, Mr. Flattery informs us by letter that "The area around Inwood is mostly small brush with the ground marshy in character but there is not an abundance of water. They had experienced a long dry spell previous to our visit to the community and it is possible that such was a decided factor in the appearance of the snakes." It will be interesting to learn whether the poisoned water method is effective in a well-watered area.--W. H. Stickel.

HOFFMAN, RICHARD L. The turtles of Virginia. Virginia Wildlife 10(8): 16-19, illus. August 1949.
Brief descriptions (with notes on range, habitat, and uses) of 13 species.

JONES-BURDICK, W. HARRY. Guide to the snakes of Colorado (Revised). 25 pages, illus. University of Colorado Museum, Leaflet No. 5. July 1949. 25¢ plus postage.
Snake stories, snake facts, an illustrated key, photos of 8 species, and descriptions of the appearance and habits of 25 species make this a useful leaflet.

LOGIER, E. B. SHELLEY. Effect of DDT on amphibians and reptiles. In Forest spraying and some effects of DDT. Ontario Department of Lands and Forests, Division of Research, Biological Bulletin No. 2, pages 49-56. 1949.
Preliminary experiments and observations in Algonquin Park in 1944 showed that DDT was poisonous to toads, 5 species of frogs, and 2 species of snakes. It probably would kill more than half of the individuals exposed to it in a sprayed area.

SCHOFFMAN, ROBERT J. Turtling for the market at Reelfoot Lake. Journal of the Tennessee Academy of Science 24(2): 143-145. April 1949.
Snapping turtles are abundant and in great demand. The author describes this industry and reflects on its relation to the local fishery and to the coot and wood duck populations.

SMITH, ALBERT G. The subspecies of the plains garter snake, Thamnophis radix. Bulletin of the Chicago Academy of Sciences 8(14): 285-300, illus. August 1949.
On the basis of a detailed study of about 2000 specimens the author recognizes four races, radix, haydenii, butleri, and brachystoma. The ranges of radix and butleri overlap broadly in the Middle West. The origin and present distribution of the races is discussed in connection with their ecology and glacial history. The paper includes a key, range map, and tables of variation.--W. H. Stickel.

REPTILES & AMPHIBIANS--Continued

SMITH, CHARLES CLINTON and BRAGG, ARTHUR N. Observations on the ecology and natural history of Anura, VII. Food and feeding habits of the common species of toads in Oklahoma. Ecology 30(3): 333-349. July 1949.

The authors analyzed the stomach contents of several hundred Oklahoma toads of 4 species (Bufo terrestris americanus, cognatus, compactilis, and woodhousii woodhousii) after several years observation of feeding and general movements. Insects, particularly beetles and ants, were the principal food of each species. Availability was the principal factor in the choice of food. Females and young ate much more than males. The great abundance of toads in grasslands suggests that they influence succession.

SMITH, PHILIP W. The reptiles and amphibians of eastern central Illinois. Bulletin of the Chicago Academy of Sciences 8(2): 21-40, illus. October 1947.

The area treated comprises 9 counties within 70 miles of Charleston, Ill. Wisconsin glaciation covered its north half. This portion was prairie and now is heavily farmed. The south half is less farmed and is principally an oak grove savannah. 56 forms are listed, with notes on their ecology.

STEBBINS, ROBERT C. Speciation in salamanders of the plethodontid genus Ensatina. University of California Publications in Zoölogy 48(6): 377-526, illus. May 1949. $2.50.

The genus Ensatina consists of 1 species with 7 subspecies distributed from British Columbia to southern California. The distribution, characters, and intergradation of the races are discussed in detail, with emphasis on ecology, evolution, and correlation of character trends with environmental factors. This work is probably the most intensive study of an amphibian group yet made. It contains a key, range maps, graphs, tables of variation, and color plates.—W. H. Stickel.

FISHES
(See also WILDLIFE (GENERAL)--MANAGEMENT, Firnie)

LAGLER, KARL F. and FISHER, CHARLES K., JR. Selected bibliography of North American fresh-water fishery biology, 1941-1946. Progressive Fish-Culturist 9(4): 213-230. October 1947.

275 titles from 18 periodicals are classified under the headings: Age and Growth, Aquatic Plants, Commercial Fisheries, Ecology and Natural History, Creel Census, Food of Fish, Introduced Fish, Marking Studies, Parasites, Pollution and Toxicities, Populations etc., Techniques.

INVERTEBRATES--(GENERAL)

BUCHSBAUM, RALPH. Animals without backbones. Revised edition. 405 pages, illus. University of Chicago Press, Chicago. 1948. $5.00 (Copied from Science for April 22, 1949, page 415).

A review by Lorus J. and Margery J. Milne reports significant improvements in this successful text that was first published in 1938.

INVERTEBRATES--(GENERAL)--Continued

JONES, J. R. ERICHSEN. An ecological study of the River Rheidol, North Cardiganshire, Wales. The Journal of Animal Ecology 18(1): 67-88, illus. May 1949.

Before 1922 this river suffered severly from lead pollution. After mining stopped in 1921 its fauna improved rapidly, and for the past 10 years there has been no significant degree of pollution. The river is swift. It drains upland with high rainfall. Its water is very soft and acid. 130 species of animals were found in the main stream, but the fauna is not really rich.

KENK, ROLIN. The animal life of temporary and permanent ponds in southern Michigan. University of Michigan, Museum of Zoology, Miscellaneous Publications No. 71. 66 pages, illus. February 1949. $1.00.

The author describes the environment and fauna of 2 temporary and 2 permanent ponds in the vicinity of Ann Arbor; the ecology of each group of animals (mostly invertebrates); and the general conditions in the temporary ponds.

RICKETTS, EDWARD F. and CALVIN, JACK. Between Pacific tides. Revised edition. 365 pages, illus. Stanford University Press, Stanford, Calif. 1948. $6.00.

This is "An account of the habits and habitats of some five hundred of the common, conspicuous seashore invertebrates of the Pacific coast between Sitka, Alaska, and northern Mexico." The first edition was published in 1939. Most of the new material in this revision is in a section on plankton. The animals are discussed under subdivisions of 5 groups of habitats: protected outer coast, open coast, bay and estuary, wharf piling, and plankton.

MOLLUSKS

CHAMBERLIN, RALPH V. and ROSCOE, ERNEST J. Check list of recent Utah Mollusca. Bulletin of the University of Utah, Biological Series 11(1): 1-16. July 1948.

Many forms are included in this list that have been described as new since the "Descriptive Catalog of the Mollusca of Utah" was published in 1929. There is a bibliography of more than 50 references.

OUGHTON, JOHN. A zoogeographical study of the land snails of Ontario. 128 pages, illus. University of Toronto Studies, Biological Series No. 57. 1948. $2.75.

This fauna consists of 88 resident species and 6 others of doubtful status. 74 species are well dispersed. Small maps show the known range of each species. Heat and the calcium content of the soil are important factors in general distribution; water is important in local distribution. There is a thorough discussion of these and other factors.

CRUSTACEANS

ANONYMOUS. The shrimp and the shrimp industry of the South Atlantic and Gulf of Mexico. 5 pages, illus. U. S. D. I., Fish and Wildlife Service, Fishery Leaflet 319. September 1948.
The leading fishery of this region. 95% of the catch is the common shrimp, Penaeus setiferus. The leaflet describes its life history and habits.

CRONIN, L. EUGENE. Comparison of methods of tagging the blue crab. Ecology 30(3): 390-394, illus. July 1949.

HIATT, ROBERT W. The biology of the lined shore crab, Pachygrapsus crassipes Randall. Pacific Science 2(3): 135-213, illus. July 1948.
A detailed account of the life history and ecology of a crab that occurs along the west coast of North America between latitudes 24° and 45° N. and along the coast of Japan and Korea.

LEONARD, A. BYRON and FONDER, LUKE H. Crustacea in eastern Kansas. Transactions of the Kansas Academy of Science 52(2): 168-204, illus. June 1949.
29 species, other than crayfishes, were found near Lawrence. The authors describe them and discuss their local occurrence and ecology.

LYLE, CLAY. Control of crawfish. Progressive Fish-Culturist 11(1): 72. January 1949.
In several prairie counties of Alabama and Mississippi crawfish do a lot of damage to farm crops. DDT-treated bait, applied in early spring, kills them.

WALLACE, M. MARVIN; FERTUIT, CAMILE J.; and HVATUM, ARTHUR R. Contribution to the biology of the king crab (Paralithodes camtschatica Tilesius). 50 pages, illus. U. S. D. I., Fish and Wildlife Service, Fishery Leaflet 340. April 1949.
This species has been our most important source of canned crab meat--most of it imported. An investigation of fishery possibilities in Alaska was carried on in 1940 and 1941.

VEGETATION (GENERAL)--COMMUNITIES & HABITATS

HORMAY, A. L. Getting better records of vegetation changes with the line interception method. Journal of Range Management 2(2): 67-69. April 1949.

PENFOUND, WM. T. An improved quadrat frame for the analysis of plant populations. Ecology 30(3): 382-383, illus. July 1949.

VEGETATION (GENERAL)--FLORAS & MANUALS

BAILEY, VIRGINIA LONG and BAILEY, HAROLD EDWARDS. Woody plants of the western national parks. 274 pages, illus. The American Midland Naturalist, Monograph No. 4. The University Press, Notre Dame, Ind., February 1949. $4.00.

The authors describe, briefly, the Pacific coast region and its 7 parks, the Rocky Mountain region and its 4 parks, the Southwest region and its 4 parks, and the Great Lakes region with Isle Royale park. There are separate field keys to the species of trees and the genera of shrubs. The latter is followed by a detailed account of the shrubs, with keys, descriptions, detailed ranges, and occasional drawings. The trees of the National Parks were described by the same authors in U. S. Dept. of the Interior Conservation Bulletin No. 6, published in 1941.

McMINN, HOWARD E. and MAINO, EVELYN. An illustrated manual of Pacific Coast trees. 2nd edition. 409 pages, illus. University of California Press, Berkeley. 1946. $4.00.

This manual covers California, Oregon, Washington, and British Columbia. Its inclusion of many non-native species (for example: 23 species of Eucalyptus, 11 of a total of 14 species of Acer) makes it much more useful than it otherwise would be. Easy keys, brief descriptions, and good drawings make its use a pleasure.

SCAMAN, EDITH. Ferns and fern allies of New Hampshire. 98 pages, illus. The New Hampshire Academy of Science, Bulletin No. 2. 1947.

Keys, simple notes on identification, detailed accounts of habitat and local range, personal notes on uses and ecology, and good drawings make this a useful and interesting flora.

VEGETATION--FOREST

BARD, GILY E. The mineral nutrient content of the annual parts of herbaceous species growing on three New York soil types varying in limestone content. Ecology 30(3): 384-389, illus. July 1949.

27 woodland species were analyzed. They included 4 clubmosses, 3 ferns, and representatives of 13 families of seed plants. The amount of calcium in most species appeared to depend mostly on the inherent capacity of the species to absorb it. "The phosphorus content.....was found to be highest on the soil type containing the greatest supply of phosphorus....." There were no clear correlations with respect to potassium and nitrogen.

CORLACK, R. G. H. A study of trout streamside cover in logged-over and undisturbed virgin spruce woods. Canadian Journal of Research C, 27(3): 78-95, illus. June 1949.

Detailed botanical surveys were made of streamsides in the Crowsnest Forest Reserve in southwest Alberta in the summer of 1944. A wide strip of virgin spruce along both sides of a river was compared with recently logged streamside cover. Heavy cutting removed most of the shade-producing trees, destroyed water-conserving ground vegetation, and produced bank erosion.

VEGETATION--FOREST--Continued

COTTAM, GRANT. The phytosociology of an oak woods in southwestern Wisconsin. Ecology 30(3): 271-287, illus. July 1949.

"The oak woods in southwestern Wisconsin have been transformed from widely spaced oak openings to dense woods in the last one hundred years." The author studied a woods near Madison and found that since it was first surveyed in 1834 the dominant bur oak has been mostly replaced by other oaks and by slippery elm, sugar maple, and basswood; while common prairie plants in the understory have been greatly reduced in numbers. Cessation of fires--formerly used by the Indians to drive game--is believed to be the cause of this change.

CRAIG, RONALD B. Virginia forest resources and industries. 64 pages, illus. U. S. D. A., Miscellaneous Publication No. 681. April 1949. 50¢ from Government Printing Office.

58% of the area of Virginia is forested--nearly all with commercial timberland. More than half is on farms, and nearly nine-tenths is in private ownership. In 1940, nearly half of the forest was the upland hardwood type, and about 40% was equally distributed among the loblolly pine, shortleaf pine, and Virginia pine types. Only one-half of the forest land bore saw-timber stands. Virginia contains 7% of the South's saw timber, and this is increasing. The bulletin includes descriptions of the physiography, natural resources, general land use, and forest types of the State. Data are based on a 1940 field inventory.

DUERR, WILLIAM A. Forest statistics for Mississippi. 67 pages, illus. Southern Forest Experiment Station, Forest Survey Release 59. May 1949.

More than half of the area of the State is forest land. 45% of the total acreage is pine; 16% is bottomland hardwood; and 34% is upland hardwood. The area of pine has dropped one-fourth and the area of upland hardwood has more than doubled in 14 years. Saw-timber stands comprise a little more than one-third of the forest acreage. Much of the forest land is poorly stocked. A map shows the distribution of generalized forest types. Data are based on the study of aerial photos and the field examination of plots.

ELLIOTT, CHARLES N. and MOBLEY, M. D. Southern forestry. 494 pages, illus. Turner E. Smith & Co., Atlanta. 1949. $2.68.

This book is intended for use in public schools and for other teaching. A chapter on "Forestry and Wildlife" discusses fish stocking, the function of a game refuge and of game laws, usefulness of birds, farmers and wildlife, and the status of wildlife in the South.

VEGETATION--FOREST--Continued

GILL, TOM and DOWLING, ELLEN C. The forestry directory. 420 pages, illus. The American Tree Association, Washington, D. C. 1949. $3.00.

This directory contains a vast amount of detail on forestry in the U. S. Department of Agriculture, U. S. Department of the Interior, Tennessee Valley Authority, the States, and Canada. There are descriptions of the activities of many forestry and conservation organizations, and descriptions of forestry education, school by school. There are accounts of farm and community forestry, demonstration forests, forest industries, wilderness areas, natural areas, and other subjects. It is all well-organized and well-indexed.

GRAHAM, EDWARD H. Wildlife in the small woodland. Pages 561-564 in "Trees; the yearbook of agriculture, 1949." Superintendent of Documents, Washington 25, D. C. 1949. $2.00.

"The rules for the management of the woodland wildlife are: Protect the woodland from uncontrolled fire, protect the woodland from intensive grazing, cut the trees selectively, preserve den trees, develop woodland borders."

HODGE, W. C.; BROWN, C. W.; and FINCH, T. L. Forest resources of southern Montana. Northern Rocky Mountain Forest & Range Experiment Station, Station Paper No. 20. 19 pages, illus. May 1949.

This survey covers 15 counties. About 10% of the area is forested (more than 2 million acres). Eastward the forest is mostly scattered ponderosa pine in the uplands and cottonwood along the waterways; westward it is mostly lodgepole pine and Douglas-fir. Data are based on the study of maps and aerial photos and on field surveys.

KELP, PAUL D. and PISSOT, H. J. Forest resources of northeast Washington. Northern Rocky Mountain Forest & Range Experiment Station, Station Paper No. 21. 28 pages, illus. May 1949.

This survey covers 6 counties. It was made 1946-1948. Forest land predominates in the 3 northern counties, farm and grassland in the 3 southern counties. A colored map shows the generalized forest types: (1) white pine, (2) ponderosa pine, (3) larch, (4) douglas-fir, (5) lodgepole pine, and (6) grand fir, hemlock, cedar, and spruce. 94% of the forest land is commercial forest. The trend of saw-timber stands is downward. Data are based on field surveys.

LULL, HOWARD W. Forest influences: growth of a concept. Journal of Forestry 47(9): 700-705. September 1949.

The facts about forest influences are partly summarized as follows:

"1. Removal of forest cover, by reducing interception and transpiration losses, generally results in increased runoff.

"2. Removal of forest cover when accompanied by baring of the soil, generally decreases infiltration and increases overland flow, soil erosion, and sediment loads.

"3. A forest cover will not prevent all flows or keep all sediment out of streams, for every watershed has inherent runoff and sediment producing characteristics.

"4. Maintenance of the natural forest cover will keep runoff and sediment loads within normal limits, and restoration of a depleted forest cover may in time restore runoff and sedimentation rates to normal."--N. W. Hosley.

VEGETATION--FOREST--Continued

McCORMACK, J. F. Forest resources of northeast Florida, 1949. Southeastern Forest Experiment Station, Forest Survey Release No. 30. 36 pages, illus. June 1949.

Forest covers about 80% of the total area of this group of 21 counties. It comprises 7.7 million acres, of which 99% is commercial forest. During the past 14 years there has been a 10% increase in total hardwoods and a 10% decrease in pines. Saw-timber stands occupy 24% of the forest land. There is a brief description of 10 forest types. Data are based on aerial photos and the field study of plots.

REEVY, FRED A. and CAMPBELL, ROBERT S. Poisoning southern upland weed trees. Journal of Forestry 47(6): 443-447. June 1949.

Experiments are described in which sodium arsenite and ammonium sulfamate were used for killing blackjack oak and other undesirable tree species. --N. W. Hosley.

STEARNS, FOREST W. Ninety years change in a northern hardwood forest in Wisconsin. Ecology 30(3): 350-358, illus. July 1949.

The author compares the data of a land survey of the 1850's with a quadrat study in 1946 of a township in Forest Co., Wisconsin. "....a trend is shown away from an evenly mixed stand of sugar maple, hemlock, and yellow birch toward a forest type with larger proportions of sugar maple and smaller proportions of both yellow birch and hemlock." It seems probable that natural disturbances occur with sufficient frequency as to permit the mixed forest to perpetuate itself,....."

STEFFERUD, ALFRED. Trees; the yearbook of agriculture, 1949. 944 pages, illus. Superintendent of Documents, Washington 25, D. C. 1949. $2.00.

Articles by many authors describe many aspects of trees and forests.

SWIFT, LLOYD W. Forests as a wildlife habitat. Pages 564-571 in "Trees; the yearbook of agriculture, 1949." Superintendent of Documents, Washington 25, D. C. 1949. $2.00.

The author describes primitive conditions in the United States; how some kinds of animals increased and others decreased as a result of its settlement; and how present notions of forest management and wildlife management are working together.

TODD, A. S., JR. and CRAIG, R. B. Forest resources of the lower coastal plain of South Carolina. 45 pages, illus. Southeastern Forest Experiment Station, Forest Survey Release No. 25. March 1948.

This report covers 9 counties south of Horry, the northernmost coastal county. Two-thirds of the area is forested--nearly all of it with commercial forest. More than two-thirds of the forest is dominated by pines. There is a brief description of 5 forest types (longleaf pine, other yellow pine, pine-hardwood, lowland hardwood, cypress-tupelo). Data are based on the study of aerial photos and the field examination of plots.

VEGETATION--GRASSLAND

DYKSTERHUIS, E. J. Condition and management of range land based on quantitative ecology. Journal of Range Management 2(3): 104-115, illus. July 1949.

The author reviews the literature from 1919 to the present; discusses ecologic principles; groups range plants into "Decreasers", "Increasers", and "Invaders"; and describes a guide for technicians that is used in West Central Texas.

HEADY, HAROLD F. Methods of determining utilization of range forage. Journal of Range Management 2(2): 53-63. April 1949.

All of the methods reviewed have shortcomings. Those based on estimation are usually accurate enough for efficient management. "The real problem is not the measurement of use.....but the interpretation of those measurements."

HERVEY, DONALD F. Reaction of a California annual-plant community to fire. Journal of Range Management 2(3): 116-121. July 1949.

Striking differences occurred on adjoining burned and unburned annual-plant ranges near Berkeley, California during the 1947-1948 growing season. Bur clover and 2 species of filaree increased in response to burning and several species of grasses decreased. There was less change in grass cover in a pasture that had been grazed heavily before it was burned.

HUMPHREY, R. R. A proposed reclassification of range forage types. Journal of Range Management 2(2): 70-82, illus. April 1949.

"A proposal is made to replace the 18 range-forage types developed by the Inter-agency Range Committee with 10 types based on predominant vegetation rather than aspect. The ten types proposed are:

"1. Grassland (Perennial grasses)
2. Meadow
3. Perennial forb
4. Annual (forbs & grasses)
5. Shrub
6. Conifer
7. Woodland
8. Broadleaf tree
9. Waste
10. Barren land"

There is a good photograph of each type.

MORRIS, MELVIN S. An ecological basis for the classification of Montana grasslands (a summary). Proceedings of the Montana Academy of Sciences 5 and 6: 41-44. 1946.

RENNE, R. R. Conservation of the western range. Journal of Range Management 2(3): 133-141. July 1949.

The author discusses public and private ownership, multiple and conflicting uses, landlord-tenant relationships, and other necessary improvements.

VEGETATION--WILDLIFE PLANTS

ANONYMOUS. Multiflora rose--a living fence! Outdoor Indiana 16(3): 15-16. March 1949.

This article describes multiflora's uses and tells how to plant and care for it. The state of Indiana will have 1½ million seedlings ready for distribution by the fall of 1949.

VEGETATION--WILDLIFE PLANTS--Continued

DOWNS, ALBERT A. Trees and food from acorns. Pages 571-573 in "Trees; the yearbook of agriculture, 1949." Superintendent of Documents, Washington 25, D. C. $2.00.

Oaks average a good crop of acorns every 3 or 4 years. Acorns are good food for deer, turkeys, squirrels, hogs, and people.

NESTLER, RALPH B.; DERBY, JAMES V.; and DeWITT, JAMES B. Vitamin A and carotene content of some wildlife foods. The Journal of Wildlife Management 13(3): 271-274. July 1949.

In order to determine possible sourcesof vitamin A for quail, 37 species of insects and other invertebrates were analyzed for vitamin A and for carotene, and 26 species of seeds and fruits were assayed for carotene. The invertebrates showed no trace of vitamin A; but 8 herbivorous invertebrates and the praying mantis contained carotene. Most of the plants contained carotene--some of them a lot (dotted smartweed, some legumes, sumac, roses, bittersweet, etc.). The amount of carotene varied among plants of the same species and even among fruits on the same plant.

RAINEY, R. S. Honeysuckle--friend or foe. Virginia Wildlife 10(8): 8-9,26, illus. August 1949.

The author gives evidence that Virginia's omnipresent Japanese honeysuckle prevents soil erosion and provides wildlife with cover and food. He tells entertainingly of the different opinion of some farmers and foresters.

VEGETATION--AQUATIC

BAUMAN, ADEN C. 2,4-D and some emergent aquatics. Progressive Fish-Culturist 9(2): 71-77, illus. April 1947.

In Missouri, Nelumbo, Dianthera, Typha latifolia, Jussiaea diffusa, Sagittaria latifolia, Pontederia, and Nuphar advena were killed within 10-65 days after treatment with 1 part of the butyl ester of 2,4-D to 130-500 parts of water. Nelumbo was particularly susceptible. Duckweed and 2 species of floating-leaf pondweeds were not affected. Fish and other animals were not affected.

COCKE, ELTON C. The Lyxophyceae of North Carolina. Journal of the Elisha Mitchell Scientific Society 65(1): 71-89. June 1949.

The author gives locality and habitat for 275 kinds of bluegreen algae--and, for a few of them, abundance and season of growth.

CORNELL, J. H. Eradication of emergent aquatic vegetation with 2,4-D. Progressive Fish-Culturist 11(2): 113-118. April 1949.

This article reports in particular on the experimental eradication of alligatorweed (Alternanthera philoxeroides) in South Carolina. It also describes the effect of 2,4-D on Typha latifolia, Scirpus validus, Sabal minor, Spirodela, Nymphaea flava, and Smilax bona-nox.

VEGETATION--AQUATIC--Continued

HASLER, ARTHUR D. and JONES, ELIZABETH. Demonstration of the antagonistic action of large aquatic plants on algae and rotifers. Ecology 30(3): 359-364, illus. July 1949.
"Dense growths of large aquatic plants, in small experimental silo-ponds, had a statistically significant inhibiting effect upon phyto- and rotifer plankton. Crustacea plankton were not affected."

MacNAMARA, L. G. Salt-marsh development at Tuckahoe, New Jersey. Transactions of the Fourteenth North American Wildlife Conference. Pages 100-117, illus. 1949.
The author describes the 13,400-acre Tuckahoe Wildlife Refuge and Management Area, in Atlantic and Cape May Counties. Since 1939, 3 ponds have been built and managed in the Cape May County portion of the area. These "Fresh-water impoundments on the salt marsh are capable of producing large amounts of desirable waterfowl food by a complete drawdown." They produce less waterfowl food but are better muskrat habitat when operated with 8 inches of water.

SNOW, J. R. Control of pondweeds with 2,4-D. Progressive Fish-Culturist 11(2): 105-108. April 1949.
This article describes the successful control at Auburn, Alabama of Sagittaria, Juncus, Typha, Paspalum distichum, Eleocharis, Myriophyllum brasiliense, Hydrocotyle, Jussiaea diffusa, and Nymphaea odorata.

SURBER, EUGENE W. Control of aquatic plants in ponds and lakes. 20 pages, illus. U. S. D. I., Fish and Wildlife Service, Fishery Leaflet 344. July 1949.
This leaflet describes control by mechanical means, fertilizers, and chemicals.

SURBER, EUGENE W.; MINARIK, C. E.; and ENNIS, W. B., JR. The control of aquatic plants with phenoxyacetic compounds. Progressive Fish-Culturist 9(3): 143-150, illus. July 1947.
Experiments at Moorefield and Leetown, West Virginia have shown that Typha latifolia, Eleocharis acicularis, Scirpus validus, Sparganium americanum, willow, Potamogeton nodosus, and Anacharis canadensis can be controlled with these compounds.

WALKER, C. H. Cattail control with scythe and 2,4-D. Progressive Fish-Culturist 10(3): 153-154, illus. July 1948.
Both controlled cattail, but the scythe was cheaper.

VEGETATION--AQUATIC--Continued

WRIGHT, T. J.; CHEADLE, V. I.; PALMATIER, E. A. A survey of Rhode Island's salt and brackish water ponds and marshes. 44 pages, illus. Rhode Island Department of Agriculture and Conservation, Division of Fish and Game, Pittman Robertson Pamphlet No. 2. May 1949.

From a survey made in 1948 the authors summarize physical and chemical factors, describe individual ponds and marshes, and describe the principal duck-food plants. Sago pondweed, wigeongrass, and other food plants grow in most of the ponds. They are abundant enough to feed more ducks in winter than are ordinarily present. However, the productivity of individual ponds may vary greatly from year to year. Summer resort activities discourage nesting.

ZIMMERMAN, F. R. Aquatic and marsh plants--their identification and use. 12 pages, illus. Wisconsin Conservation Department, Madison 2, Wis. 1949.

The author describes limiting factors, tells how to plant, and discusses the uses of different plants as food and cover for waterfowl and muskrats. There is a key to more than 30 species.

LAND & SOILS
(See also VEGETATION--FOREST, Trimble & Tripp)

GUSTAFSON, A. F. Using and managing soils. 420 pages, illus. McGraw-Hill Book Co., Inc., New York. 1948. $2.80.

Specific information on tillage, water control, and erosion control; on the management of acid and alkali soils; on maintaining fertility; and on managing field crop, garden, and pasture soils. Each chapter has a summary,

WATER
(See also INVERTEBRATES (GENERAL), Jones)

ANONYMOUS. Indian--child of nature--appreciated Indiana's myriad of cool, clear lakes. Outdoor Indiana 16(8): 14-15, illus. August 1949.

Some facts about drainage--particularly in the Kankakee Swamp.

ARNOLD, EARL. Stream pollution in North Dakota. North Dakota Outdoors 11(11): 7,12, illus. May 1949.

The author describes conditions in the major streams of the State. Pollution is bad in the James, Mouse, and Red Rivers. Some of it has been, and much more can be, eliminated.

FREY, DAVID G. Morphometry and hydrography of some natural lakes of the North Carolina coastal plain: the bay lake as a morphometric type. Journal of the Elisha Mitchell Scientific Society 65(1): 1-37, illus. June 1949.

This is the first report on an investigation begun in 1947 under the sponsorship of the North Carolina Wildlife Resources Commission (a separate report on biota will follow). It deals with 6 lakes in Bladen and Columbus Counties, N. C. They are all saucer-shaped and have single depression basins 5-12 feet deep. Westerly winds have had a marked influence on the morphometry and hydrography of the basins. The lakes tend to be dystrophic,

WATER--Continued

and strongly acidotrophic. All have only small quantities of materials in solution. One, Lake Waccamaw, has neutral water because of its contact with geological formations other than clean sand. A photographic mosaic shows 5 lakes in relation to their containing bays and to numerous other filled bays. Maps show hydrography and distribution of bottom sediments for each lake.

RAESSLER, A. H. Pollution abatement progress in Virginia. Virginia Wildlife 10(9): 16-17,22-23, illus. September 1949.

SCHEELE, LEONARD A. Stream pollution program under public law 845. Transactions of the Fourteenth North American Wildlife Conference. Pages 36-41. 1949.

The provisions of Public Law 845 are as follows: "(1) The development, by the Public Health Service, state, and interstate agencies, of comprehensive programs for the abatement of pollution; (2) research upon the causes, means of prevention and treatment of pollution; and (3) construction of remedial works." The Public Health Service is responsible for the administration of the total program and the Federal Works Agency is responsible for administering loans to municipalities for construction of remedial works approved by the states and the Public Health Service.--M. A. Slattery.

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